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Helmholtz-Zentrum für Ozeanforschung Kiel

RV SONNE
Fahrtbericht / Cruise Report
SO242-2

JPI OCEANS Ecological Aspects of Deep-Sea Mining
DISCOL Revisited

Guayaquil - Guayaquil (Equador)
28.08.-01.10.2015

Berichte aus dem GEOMAR
Helmholtz-Zentrum für Ozeanforschung Kiel

Nr. 27 (N. Ser.)

Dezember 2015

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1. Cruise summary / Zusammenfassung

1.1 Cruise summary, English

The scientific work during SO242/2 (28. August - 01. October 2015) was part of the JPIO Pilot Action ‘Ecological Aspects of Deep-Sea Mining‘. The main goal was to study the potential long-term ecological impact of anthropogenic disturbances on the deep-sea floor from mining polymetallic Mn-nodules. The expedition SO242 built on studies of the former German TUSCH projects (1989-1996) with four RV SONNE cruises to the DISCOL Experimental Area in the Peru Basin, South Pacific (7°S, 88.5° W; 4150 m water depth) between 1989 and 1996 (DISCOL and ATESEPP projects). The integrated ecological studies were carried out within and next to plough tracks of the original DISCOL experiment 1989, which mimicked seafloor disturbances similar to those occurring during nodule mining. Leg 242/2 extended the investigations started during leg 242/1 with a focus on biogeochemical and biological sampling and observations, including comparative studies of the composition of benthic communities (all size classes) as well as of ecosystem functions (remineralization rates, transfer of matter and energy in food webs, ecotoxicology). In addition, observations were continued of the physicochemical characteristics of the DEA, including the overlying benthic boundary layer. The nodule fields surrounding the DEA were used as references for undisturbed areas. A large proportion of the work was based on autonomous instruments and sensor modules that were deployed by means of ROV and lander systems. In addition, ROV-manipulated and telemetry-guided instruments such as the Ocean Floor Observatory System were used for targeted sampling and surveys. Food-web experiments including some small-scale disturbances were carried out and sampled directly at the seafloor by the ROV.

1.2 Zusammenfassung Deutsch

Die Arbeiten des Abschnitts SO242/1 (28. August - 01. Oktober 2015) tragen wie der vorherige Abschnitt SO242/2 zum Europäischen Projekt "JPIO Pilot Action - Ecological Aspects of Deep-Sea Mining" bei. Ziel ist die Charakterisierung langfristiger ökologischer Auswirkungen von anthropogenen Störungen auf Tiefsee-Ökosysteme, wie sie mit dem Abbau von polymetallischen (‚Mangan'-) Knollen einhergehen werden. Während des TUSCH-Programms (1989-1996) wurde vor 26 Jahren mit einem ‚Tiefsee-Pflug' der Manganknollen-Abbau im Untersuchungsgebiet DISCOL Experimental Area (DEA) im Perubecken (Südpazifik) in 4150 m Wassertiefe simuliert und während vier aufeinanderfolgender FS SONNE-Fahrten von 1989 bis 1996 untersucht, im Rahmen der DISCOL und ATESEPP Projekte. Der Fokus der Untersuchungen des Abschnitts 242/2 lag bei Fragen der Veränderung der Zusammensetzung benthischer Lebensgemeinschaften aller Größenklassen von Organismen sowie auf ihren Ökosystemfunktionen, einschließlich biogeochemischer Prozesse, Stoff- und Energietransfer in Nahrungsnetzen und der Ökotoxikologie. Zusätzlich wurden die physikochemischen Merkmale des Gebietes und der darüber liegenden Bodenwasser-Grenzschicht charakterisiert. Als Referenzgebiet für die integrierten ökologischen Untersuchungen wurden die umliegenden ungestörten Manganknollenfelder beprobt. Ein großer Teil der Arbeiten wurde mit autonomen Messgeräten durchgeführt, die mit Hilfe des ROV oder mit Lander-Systemen ausgebracht wurden. Das ROV sowie andere bildgebende Geräte wie das Ocean Floor Observatory System wurden auch für gezielte Surveys eingesetzt. Zudem konnten eine Reihe von Experimenten zum Nahrungsnetz, zur Ökotoxikologie und zu frischen kleinskaligen Störungen durchgeführt werden.

2. Participants / Fahrtteilnehmer

2.1 Principal Investigator / Projektleiter

Prof. Dr. Antje Boetius	Chief Scientist / *Fahrtleiterin*	MPI / AWI

2.2 Scientific Party / Wissenschaftliche Fahrtteilnehmer

Dr. Fritz Abegg	ROV team coordinator / *ROV Team Koordinator*	GEOMAR
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Kristin Hamann	Scientist geochemistry / *Wissenschaftlerin Geochemie*	GEOMAR
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Dr. Johannes Lemburg	Engineer Crawler / *Ingenieur Crawler*	MPI / AWI
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Arne Meier	ROV Pilot / *ROV pilot*	GEOMAR
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2.3 Crew / Mannschaft

Oliver Meyer	Master / Kapitän
Yves Soßna	Chief Mate / *Ltd. Nautischer Offizier*
Achim Schüler	Chief Engineer / *Ltd. Technischer Offizier*
Lars Hoffsommer	1st Mate / *1. Nautischer Offizier*
Tim Henning	2nd Mate / *2. Nautischer Offizier*
Anke Walther	Surgeon / *Schiffsarzt*
Roman Horsel	2nd Engineer / *2. Technischer Offizier*
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Stefan Meinecke	System Operator / *Elektroniker (WTD)*
Wolfgang Borchert	System Operator / *System-Manager (WTD)*
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Frank Heibeck	Motorman / *Motorenwärter*
Georg Hoffmann	Motorman / *Motorenwärter*
Lothar Münch	Motorman / *Motorenwärter*
Sebastian Thimm	Motorman / *Motorenwärter*
Torsten Bierstedt	Boatswain / *Bootsmann*
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Michael Zeigert	A.B. / *Schiffsmechaniker (Deck)*
Reno Ross	A.B. / *Schiffsmechaniker (Deck)*
Stefan Burzlaff	A.B. / *Schiffsmechaniker (Deck)*
Stefan Koch	A.B. / *Schiffsmechaniker (Deck)*
Torsten Kruszona	A.B. / *Schiffsmechaniker (Deck)*
Torsten Bolik	Fitter / *Deckschlosser*
Frank Tiemann	Cook / *Koch*
Andreas Spieler	Cooksmate / *Kochsmaat*
Andreas Pohl	Steward / *Steward*
Jan Hoppe	Steward / *Steward*
Sven Kröger	Steward / *Steward*
Sylvia Kluge	Stewardess / *Stewardess*

3. Narrative of the cruise / Ablauf der Forschungsfahrt

A Boetius

The mission SO242/2 started on 28 August 2015. We left the port of Guayaquil at around noon, after the last bits of freight and technical support had been provided to the ship. It took about 4 hours to transit the river Guayas, and then 2 days to reach our working area, the DISCOL experimental area DEA at 7°S and 88.5°W (Fig. 3.1).

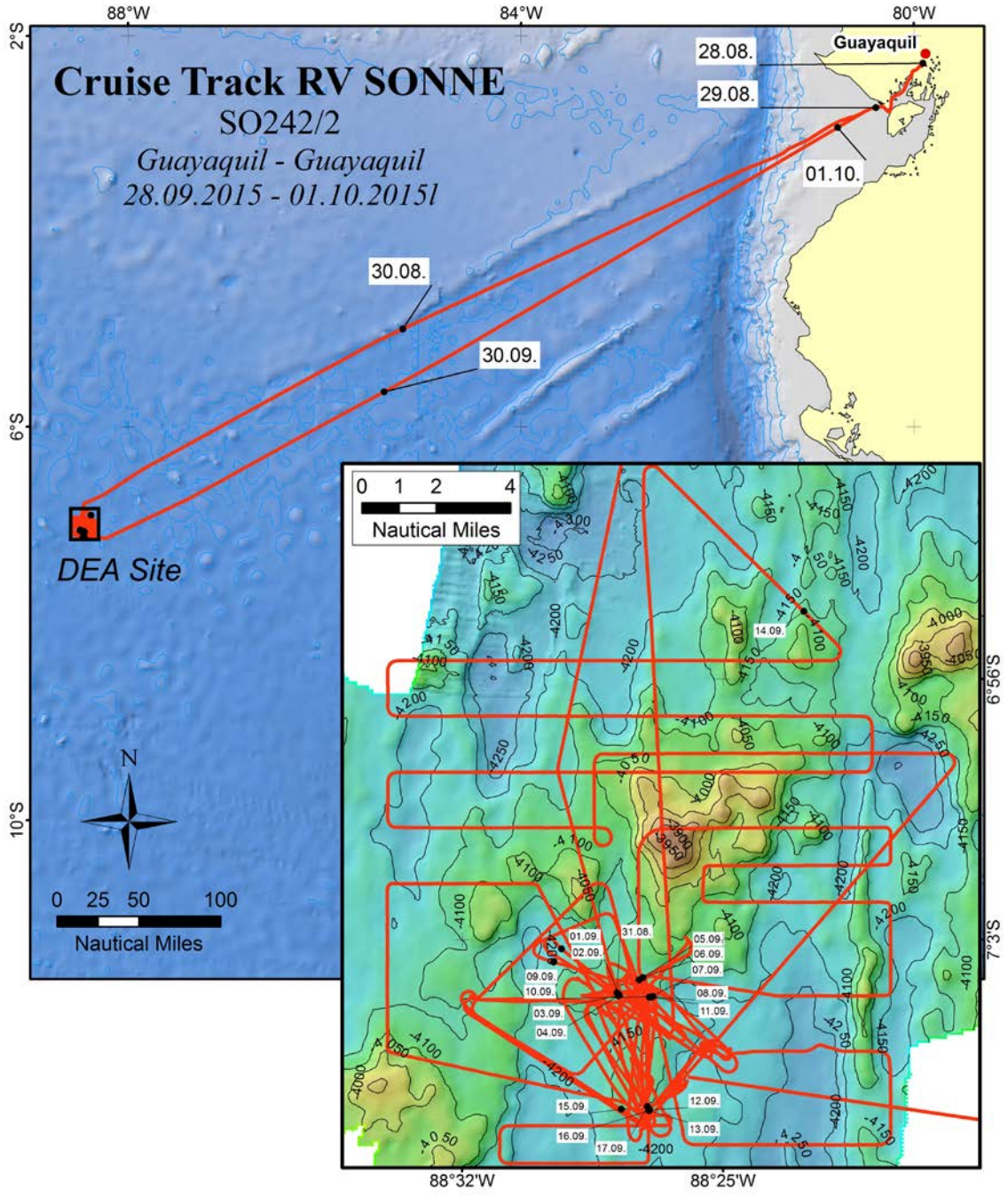


Figure 3.1. *Cruise tracks to and within the DISCOL area by RV SONNE during SO242/2.*

Due to good weather conditions, the new SONNE could reach an average velocity of around 14 knots. We started a multibeam survey (station 137-1) when we had left the EEZ of Peru, at 10 pm UTC on 30 August. Station work started with a CTD to set the sound velocity profiles and to get an impression of the background turbidity in the waters. We detected a large oxygen minimum zone hovering above our working area, extending from 150 to 1000 m with oxygen concentration below 63 µM, and reaching almost zero between 400-600, which we observed during the cruise as a side program in addition to our deep CTD casts. In the night we carried out the first OFOS track to get an impression of seafloor landscapes and the nodule coverage, as well as the main types of disturbance traces and fauna to be surveyed in the coming weeks. We also placed the first combined chamber and profiler lander to measure respiration rates in undisturbed zones of low nodule coverage. On 31 August we started the day with the first ROV dive targeting the plough tracks of the western DEA. We quickly identified typical microhabitats that were created by the 1989 ploughing activities: the plough pushed the otherwise very smooth abyssal deep-sea muds into ripples, and created heaps of mud at the side of the tracks. Inside the tracks, sometimes the brownish surface sediments were completely scraped off and we could see the whitish-grey color of the underlying subsurface sediments. In the early morning hours of 1 September we placed another chamber lander, and a deep-sea elevator to transport our sampling equipment to the seafloor for the next ROV dives. We quickly developed a routine for the dives, with an exchange of elevators before and after the dives, and an almost daily ROV dive from 08:30 am until about 8:00 pm. Every 4-5 days, one day was used for ROV maintenance and other station works. The deep-sea elevators are deployed by a telemetry-navigated launcher, that allows precise positioning of the elevators next to the tracks, to minimize the dive time needed to place and recover our various instruments. We sampled the DEA West plough track between 01 and 04 September with ROV dives during the day, and CTD with in situ pumps, and OFOS surveys during the nights. The in situ pumps filter large volumes of waters, we use them to determine the baseline particle content in bottom waters from natural turbidity, as well as to obtain information as to the increase in turbidity due to surveying activities. The Southern Reference area was sampled by multiple corer, to complete the measurements of leg 242/1. Between 5 and 10 September, we focused on the East DEA and deployed experiments for food web studies (CUBEs, Respirometers), ecotoxicology (Corrals) in and around plough tracks. We also carried out the high-resolution sampling for biogeochemistry, meiofauna and microbiology a second time, in a plough track with clear signs of plume sedimentation. On 8 September a highlight of the dive 196 was the deployment of the new ROBEX crawler “Tramper” for technical tests. At night between dives, we alternated between the OFOS and the CTD with in situ pumps. In the early morning hours, we redeployed the elevator with the in situ biogeochemical tools, the benthic chamber and profiler. Any gap in the program we filled with Parasound tracks to contribute to the sonar survey of the area started by leg 242/1. On 11 September we dove at the Southern Reference area, to start a small disturbance experiment (Sediment dispensers) aiming to test the response of meiofauna to getting covered by nodule debris. We also recovered and redeployed landers and carried out more in situ pumping of bottom waters. On 13 September, we carried out a short dive to test a hyperspectral camera for deep-sea surveys, and to look for the LBL mooring of leg 242-1 that was not recovered due to imploded glass

spheres. Between 15-16 September we continued diving for the experiments at the Southern Reference, and did some more OFOS and parasound surveys at night. Then we started the next sampling and survey set in the Southwestern area of the DEA where fresh tracks of the epibenthic sledge used during leg 242/1 crossed old plough tracks. During OFOS surveys we found that the fresh sledge marks of a few meters width could serve as a new disturbance category for our measurements, to compare benthic functions and geochemical processes to the old tracks that were created 26 years earlier. We sampled the EBS track between 17-21 September, and then returned on 22 September to the Southern Reference to recover the samples from the “sediment dispenser” experiment by a dedicated ROV dive. This dive (216) was also used to deploy the ROBEX Crawler “Tramper” a second time and observe its behavior at the deep-sea floor. Unfortunately it did not release, and had to be recovered by the ship’s wire hooked into the crawler by the ROV which stayed at the seafloor until the crawler was safely recovered. During the last week of the expedition we deployed experiments in the central DEA and sampled in high-resolution the microhabitats of the 12m-wide plough tracks between 23-26 September. At night, we carried out lander recoveries and deployments, the last shallow (OMZ survey) and deep CTD casts and more OFOS dives. The OFOS strategy was to collect similar amounts of seafloor images from the DEA and its surrounding reference areas, as well as for the different habitat categories “plough track”, “next to track”, “undisturbed DEA”. Finally, also a calibration dive was carried out, to repeat a dive of the OFOS of leg 242-1 at 3.5 m above seafloor. On 26 and 27 September winds increased to 6-7 Bft, and wave height to 4 m. Hence, on 27 September we could not dive with the ROV. All other station work was not affected, and we could retrieve all moorings and landers as planned, including the BoBo lander and thermistor mooring of leg 242/1. Also, we carried out another multiple corer sampling of the Central DEA 15 m off the plough track by precise Posidonia positioning. On 28 September weather conditions slightly improved, and a last scientific ROV dive was carried out at Central DEA to recover the remaining instruments and experiments from the seafloor. The last ROV dive was dedicated to the search of the DOS lander (221-1), which we could not release, despite multiple attempts. It was placed on a mound structure with very rough and rocky terrain. The ROV could not find the DOS lander by its sonar, and it was given up shortly before the last station works of this cruise leg. The last OFOS dive was carried out on 29 September to rescue the collapsed LBL mooring by mounting a hook to the OFOS frame and using the ship’s high resolution DP to hover above the mooring position. The recovery was successful. After the retrieval of the last benthic lander from the central DEA, the station work was ended on 29 September at 10:00 UTC, and the transit back to Guayaquil was started, along a multibeam track for seafloor mapping (station 237-1).

We arrived at the Guayas pilot station in the early morning hours of the 1 October, and end the cruise in Guayaquil port (Ecuador). The leg SO242/2 to the DEA with the new SONNE and the ROV Kiel 6000 was highly successful, the working program was completed to almost 100%. All 40 scientists on board (Fig. 3.2) thank captain and crew of RV SONNE for the excellent support at sea.

Figure 3.2. *Scientific party of SO242/2.*

4. Aims of the cruise / Zielsetzung der Forschungsfahrt

A Boetius

Leg 2 aimed at high resolution surveying of the impact of the DISCOL disturbance on the benthic community structure of microbial assemblages and ecosystem function, including geochemical fluxes. It will also provide an assessment of ecosystem state for various levels of nodule coverage. Scientific investigations during cruise SO242/2 include the study of communities of benthic organisms of different size classes (mainly mega-, meio-, and microfauna), connected to detailed studies of biogeochemical and food-web processes. Leg SO242/1 had assembled maps of the plough tracks in the working area (DISCOL experimental area; DEA) that were created in 1989 by means of a ‘deep-sea plough’. Leg SO242/2 had planned to carry out high-resolution studies of the plough tracks, their immediate vicinity and the reference area outside DEA. In addition, localized disturbance experiments were planned. The main research questions were targeted at the effect of disturbances on different ecosystem compartments and processes including:

- Physicochemical habitat characteristics
- Geochemical and biogeochemical processes at the seafloor and in the bottom waters
- Composition of benthic assemblages (mainly mega-, meio-, and microfauna)
- Metabolic activity and transfer of energy and matter in benthic communities
- Release, bioaccumulation, and ecotoxicological effects of contaminants

Specific scientific questions to be addressed during leg 2 included:

- Have ecosystem functions such as respiration, productivity and nutrient remineralization recovered 26 years after the disturbance?

- How is the state of re-equilibration in the surface sediment 26 years after the disturbance?

- What will be the immediate release of chemical components during a sediment surface disturbance?

- What is the natural baseline of relevant ecosystem functions for areas of different nodule coverage?

- How do abundance, diversity and community structure of microorganisms and megafauna compare between disturbed (DEA) and undisturbed nearby sites?

- How do the diversity and morphotype composition of sessile and motile megafauna as derived from images from the 1980s compare to those in 2015 in the DEA and undisturbed control sites?

With the data, we will contribute mostly to JPIO WP2 that will investigate the biodiversity and community structure of benthic microbial and metazoan communities at disturbed and undisturbed sites in the DISCOL area. As contribution to WP3 we will investigate geochemical and biogeochemical conditions and processes in the surface sediments, to quantify solute fluxes across the sediment-water interface and trophic interactions including the flow of energy and the bioaccumulation of metals and other toxicants. Additionally, by in situ experimentation with the ROV, and by deploying in situ pumps on a CTD water sampler, we will contribute data to WP4, assessing potential impacts resulting from the release and dispersion of sediment plumes in the water column. We have put a lot of attention to data management for the fully integrated ecological studies (WP6), and to communication of observations and first results to the public already during the cruise by interviews, and a project blog.

5. Agenda of the cruise / Programm der Forschungsfahrt

A Boetius

The set-up of the DISCOL disturbance experiment is unique in terms of its gradient in disturbance that can be assessed by the number of plough tracks in the different segments of the DEA, and by the efficiency with which nodules were removed. The agenda of the cruise was set so as to address the recovery of ecosystem functions after 26 years such as total benthic respiration, remineralization and nutrient transport, bacterial productivity, microbial biodiversity (including rare types and community turnover on small and intermediate spatial scales), and faunal composition and biomass. For sampling, we have distinguished areas i.) with plough tracks, ii.) next to tracks, iii.) undisturbed nodule fields within the DEA and surrounding it, and iv.) fields bare of nodules. Within the plough tracks we have distinguished three types of habitat categories (white patches characterizing locations were subsurface sediment was deposited on top of the surface layer; ripple crests and valleys) as well as the undisturbed “next to track” area about 5-10 m away from the plough track. These habitats were sampled with 3 spatial replicates each in three different areas of the DEA. In addition, we have carried out small scale experiments by removing nodules with the ROV arm and measuring ecosystem function before and after nodule removal, and – as a rather fresh disturbance – we sampled a new track that was made by an epibenthic sledge during 242/1 3-4 weeks before our leg. The towed imaging system OFOS (Ocean Floor Observation System) and the ROV camera systems were used for detailed characterizations of the seafloor habitat and for quantitative megafauna surveys. Observations of physical processes in the benthic boundary layer and the deep water column that have been started already during leg 242/1 were continued by means of seafloor observatories (DOS- and BoBo Lander) and thermistor string moorings that we recovered at the end of our leg. Sediments were sampled by ROV-manipulated pushcores and with the Multicorer (Reference areas). The samples are used to analyze communities of small organisms (mainly meio- and microfauna) by means of traditional and molecular methods. Sediments will also be used for geochemical investigations of pore waters and the solid phase. Other biogeochemical investigations are carried out directly at the seafloor: ROV-modules like the microsensor profiler, different benthic chamber for respiration measurements and other autonomous instruments (landers) are used to investigate chemical gradients in the uppermost sediment layer and to quantify solute fluxes across the sediment-water interface.

Some ROV-manipulated microcosms were used for in situ experiments to investigate the transfer of organic matter and energy in benthic food webs. Additional experiments target short-term effects as a result of mechanical disturbances and exposition to contaminants and settling fines. CTD/Rosette samplers and in situ pumps were employed to sample plumes of particulate matter and dissolved contaminants that are expelled by means of deliberate manipulations or those occurring during station work. The spreading of particle plumes was investigated by means of CTD turbidity sensors and MAPR sensors. For the first time this will allow a holistic assessment of the biogeochemistry and ecosystem functioning of nodule

areas including feedbacks between biological and geochemical processes, how they are affected by the mining impact and what time is required to establish a new equilibrium after the disturbance by mining activities. These investigations are possible by combining a broad range of disciplines and methodologies including state-of-the-art geochemical and ecotoxicological analyses, in situ biogeochemical sensing and incubations, as well as advanced stable isotope studies based on natural isotope ratios and process studies with labeled material.

6. Settings of the working area / Beschreibung des Arbeitsgebietes

S Roeßler, A Boetius

The leg SO242/2 started and ended in the port of Guayaquil, Ecuador, and all station work targeted the Discol Experimental Area (DEA, Fig. 6.1) and its surrounding seafloor. In 1989 an area of 11 km^2 of the deep sea floor (7° S, 88.5° W; 4150 m water depth, Peru basin, South Pacific) was plowed with a plow harrow device in the area of a German manganese nodule claim. The DEA was defined as a circular area of 2 nm in diameter that was crossed 78 times with the plough-harrow. In total only about 20% of the circular DEA was directly ploughed, with the remaining 80% being covered by an up to 30-mm-thick resuspended sediment layer (Schriever and Thiel, 1992).

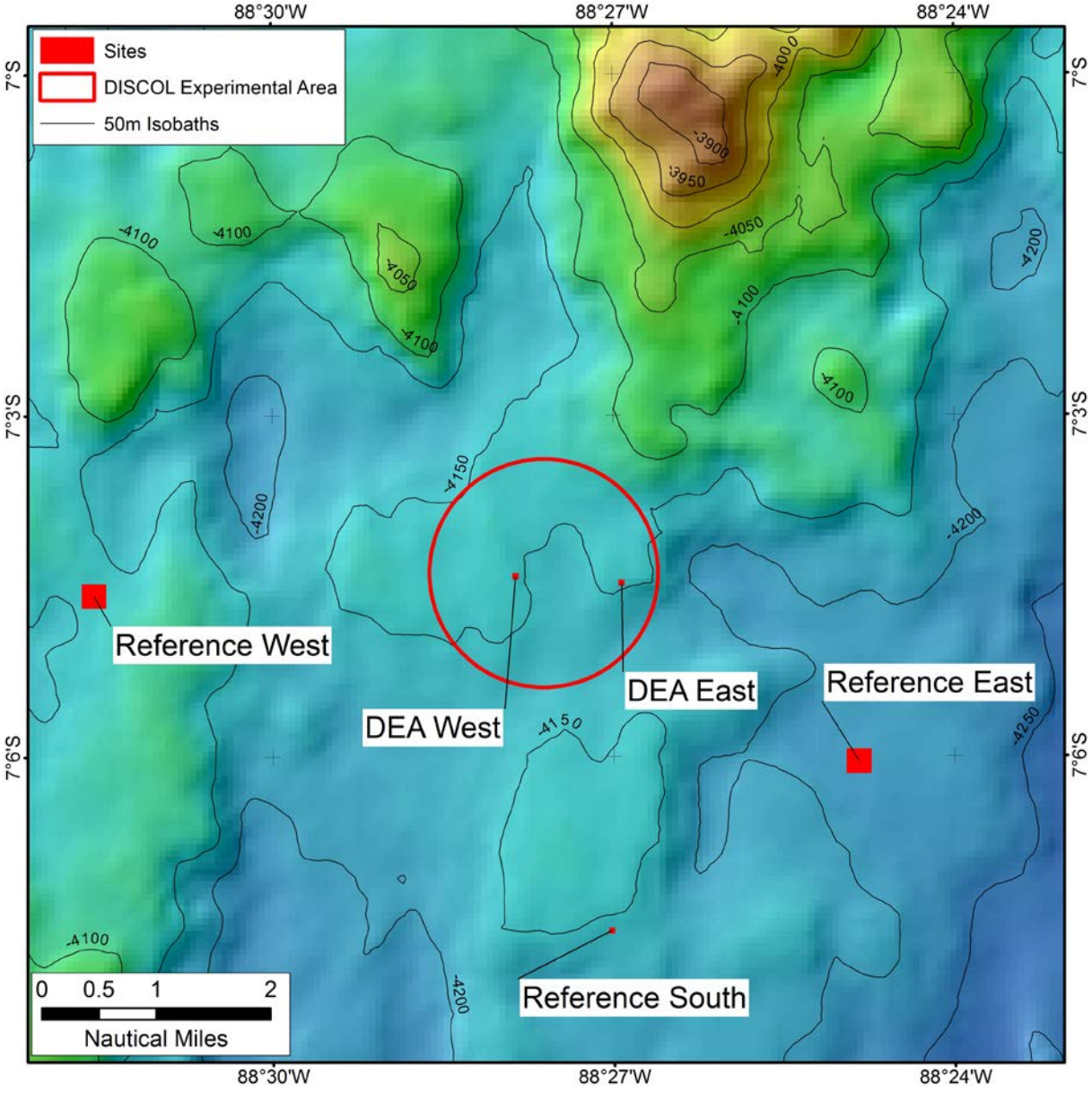


Figure 6.1. *Location of the DEA and reference stations.*

The following experimental disturbances were created: disturbance of the deep-sea sediment by the direct plow harrow impact, removal of nodules (they were ploughed under, or pushed to the side of the tracks or onto ripple lines), and increased sedimentation by a sediment plume covering parts of the area. The DEA was revisited several months after the experiment, and again after several years, by the DISCOL project (DISturbance and reCOLonisation experiment) and its follow-up project ATESEPP (Impacts of potential deep-sea ecosystem in the southeast Pacific). The disturbance effects were verified by photographic and video imaging, and were still discernible after 7 years (Bluhm et al., 1995; Bluhm, 2001).

During SO242/2 we carried out 22 scientific dives at 4 sites within the DEA (Fig. 6.2), and at the Southern Reference area, that was already sampled in 1989 and subsequent years to obtain a baseline of undisturbed seafloor throughout the DISCOL and ATESEPP projects.

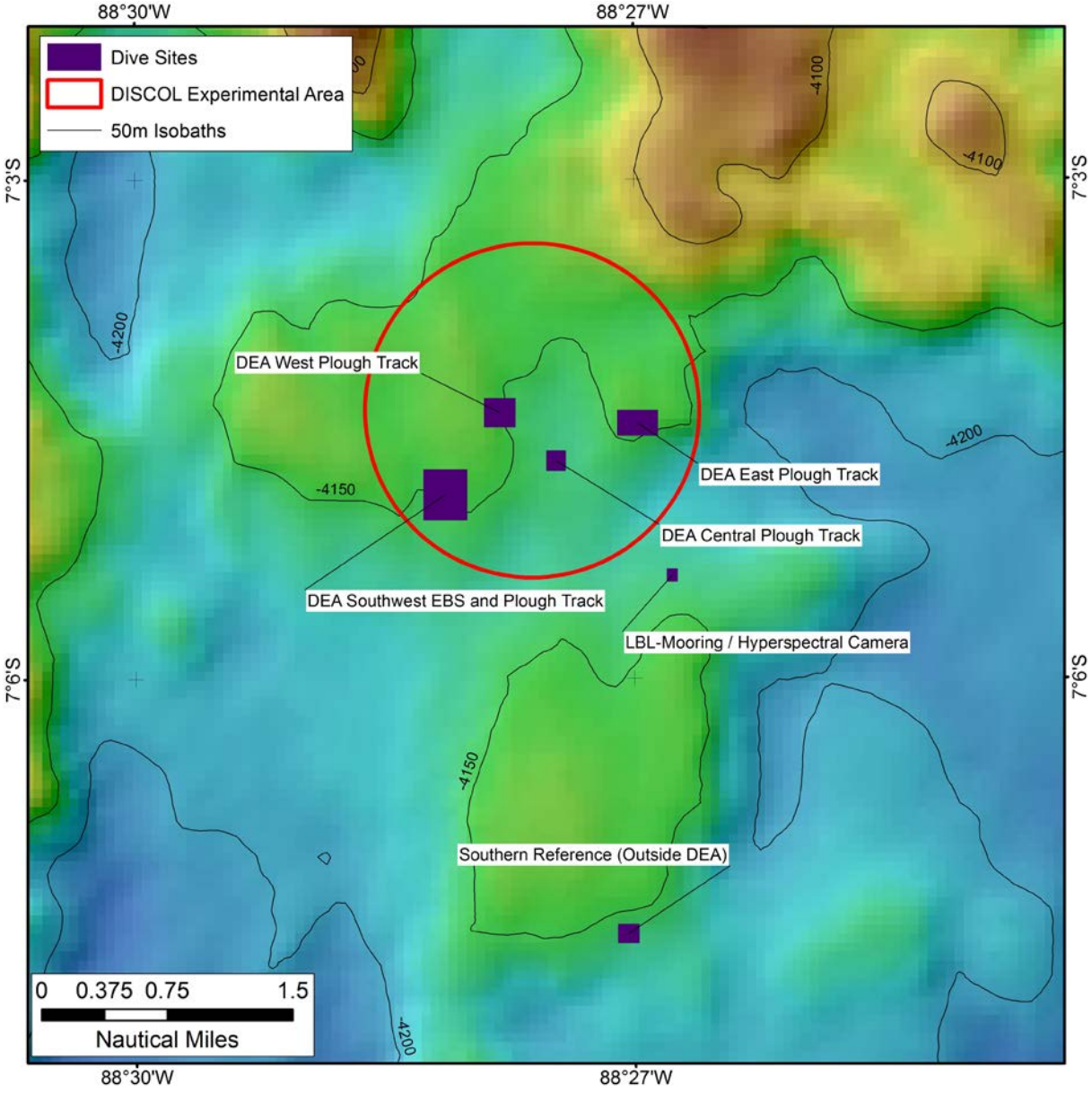


Figure 6.2. *ROV dive sites during SO242/2.*

Our main target areas for sampling, measurements and observations were the plough tracks of the DEA West, East, Centre and Southwest. The latter area was crossed by an epibenthic sledge deployment during leg SO242/1, which was used by us as a fresh disturbance site. We obtained a few additional multiple corer samples in the same areas as targeted by leg SO242/1, to complete the faunal and biogeochemical sample sets with microbiological sampling and rate measurements (Fig. 6.3).

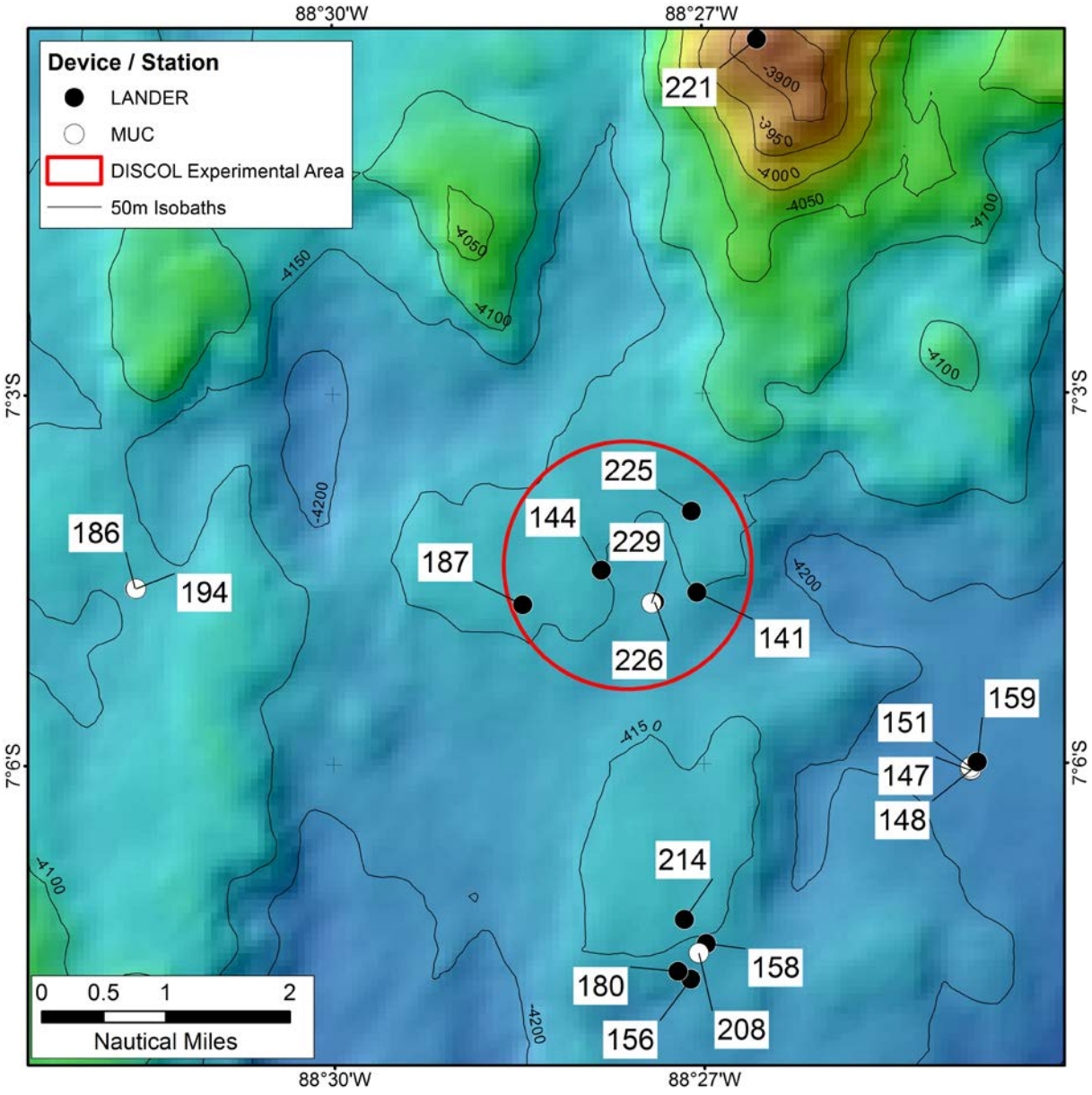


Figure 6.3. *Locations of biogeochemical and microbial sampling during SO242/2.*

The Ocean Floor Observation System OFOS was deployed within and around the DEA (Fig. 6.4) to compare disturbed and undisturbed locations in various categories: within and next to plough track, within and around the central DEA (highest disturbance and sedimentation), between DEA and surrounding reference areas.

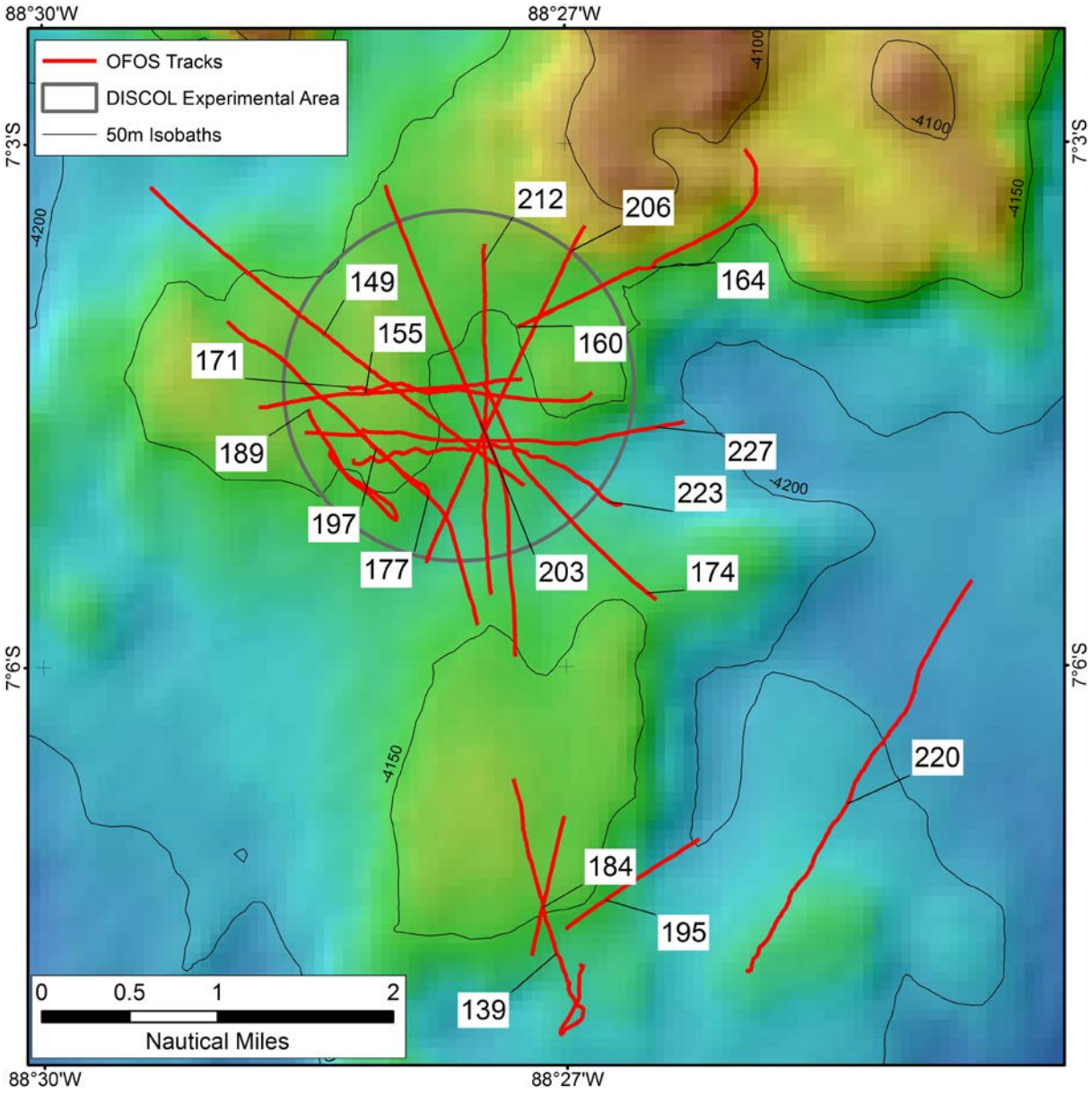


Figure 6.4. *Tracks of OFOS dives carried out during SO242/2.*

In addition, we contributed to international ocean floor mapping using the excellent hydroacoustic facilities of the FS SONNE by adding two multibeam tracks in transit between Guayaquil and the DEA to the mapping activities of leg 242-1 (Fig. 6.5).

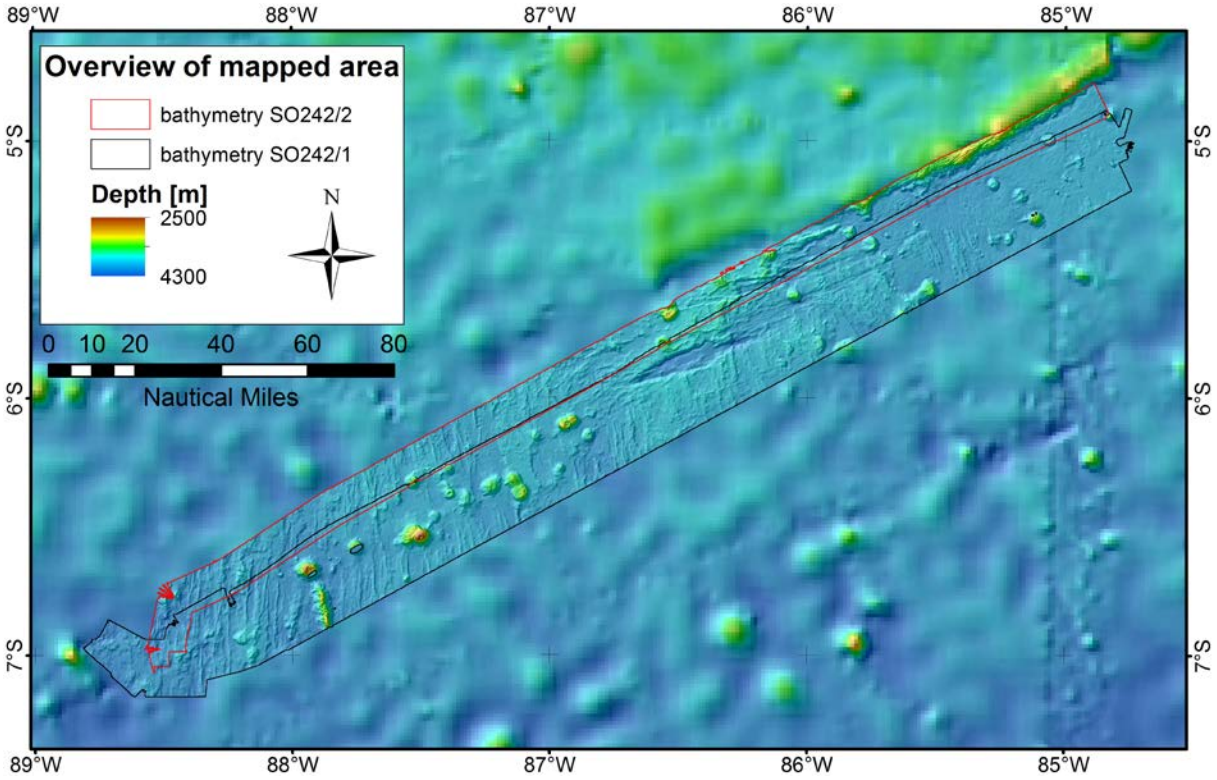


Figure 6.5. *Overview of bathymetry mapped during SO242/1 and SO242/2.*

7. Work details and first results / Beschreibung der Arbeiten im Detail einschließlich erster Ergebnisse

7.1 Ships multibeam & parasound

S Roessler

7.1.1 Ship-based multibeam echo sounder EM122

The shipboard deep sea multibeam echo sounder of RV Sonne is a Kongsberg EM122. It operates with a frequency of 12 kHz and has 432 beams with beam widths of 1° along track and 0.5° across track. The beam width was set to 130° (65° for the starboard and portside transducer) resulting in a swath width of ca. 17 km at a water depth of 4 000 m. Peripheral sensors connected to the multibeam are a Seapath MRU-GPS system (delivering position and the ship's roll, pitch and heading angles) and a sound velocity keel probe. A sound velocity profile from the first CTD cast was uploaded into the system upon arrival at the working area.

During the previous leg SO242/1, an area of 18 286 km² has already been mapped using the ship-based multibeam echo sounder EM122. In order to contribute to this dataset, the transit-routes to and from the DISCOL Experimental Area were chosen north and south of the already surveyed area (Figure 7.1.1).

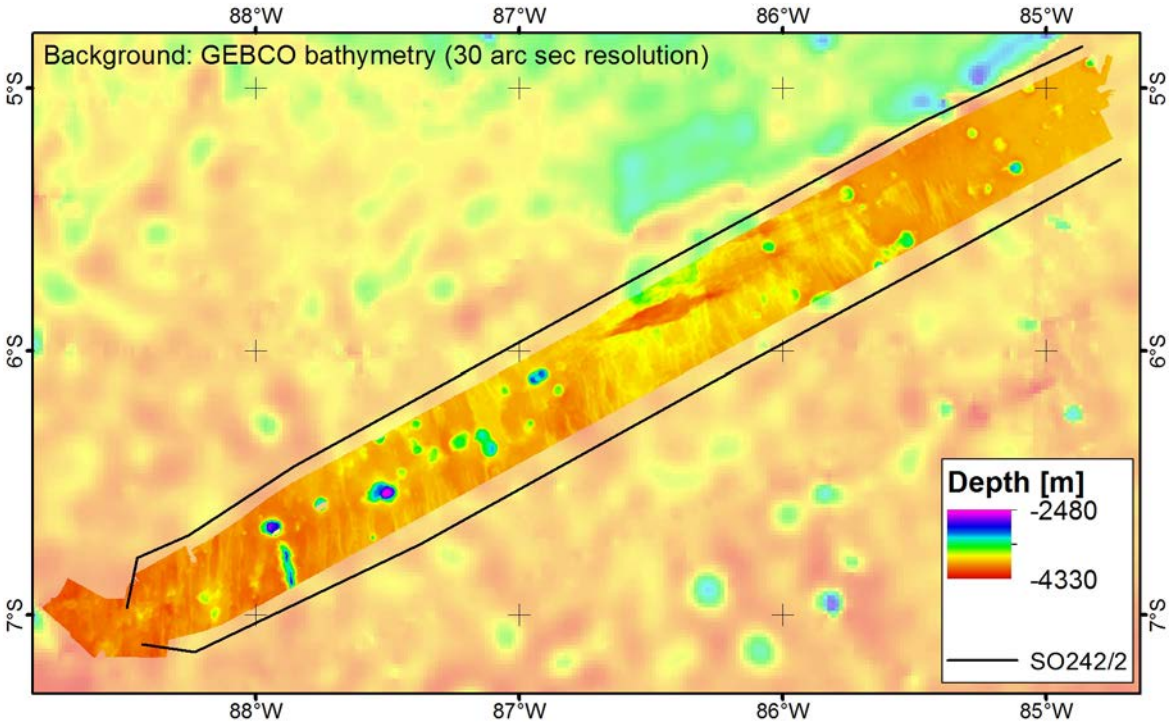


Figure 7.1.1. *Map showing the multibeam survey of SO242/1 and the two survey routes during SO242/2*

Data are stored in the common Kongsberg .all file-format and were exported from the software Kongsberg SIS into xyz data files. The xyz datafiles were gridded and plotted using GMT 5.1.1.

7.1.2 Sub-bottom profiling – Parasound

The Atlas Parasound DS3 is a hull-mounted sub-bottom echo sounder on board RV Sonne. It is used to detect the internal structures of sedimentary cover along the ship's track. To penetrate the sedimentary layers at the sea floor, a low frequency signal is required. Since a combination of a reasonably small transducer and a very narrow beam is desired the system takes advantage of the parametric effect, which results from the non-linear hydro-acoustic behavior of water for high energy signals. The transmission of 2 high energy wave-form signals of slightly different frequencies (20 kHz and 24 kHz) creates harmonics at the difference frequency (i.e. 4 kHz) and at the frequency sum (i.e. 44 kHz). With an opening angle of 4 x 4.5° the system provides high resolution information of the sedimentary layers down to a depth of 200 m below sea floor. The system automatically adds positions and compensates ship's movements by applying roll, pitch and heave values from the Seapath MRU-GPS system.

Main objective of the sub-bottom profiling echo sounder operations with the shipboard Atlas Parasound DS3 system was the detection of seafloor characteristics and sediment structures within the DISCOL Experimental Area (Figure 7.1.2). Parasound profiles were recorded during 17 stations (including the transit from and to Guayaquil) at a survey speed of typically 5 knots (13 knots during transits). The echo sounder's parameters were set to 18 kHz desired primary high frequency (PHF) and 4 kHz secondary low frequency (SLF); the pulse length was set to 1.25 ms.

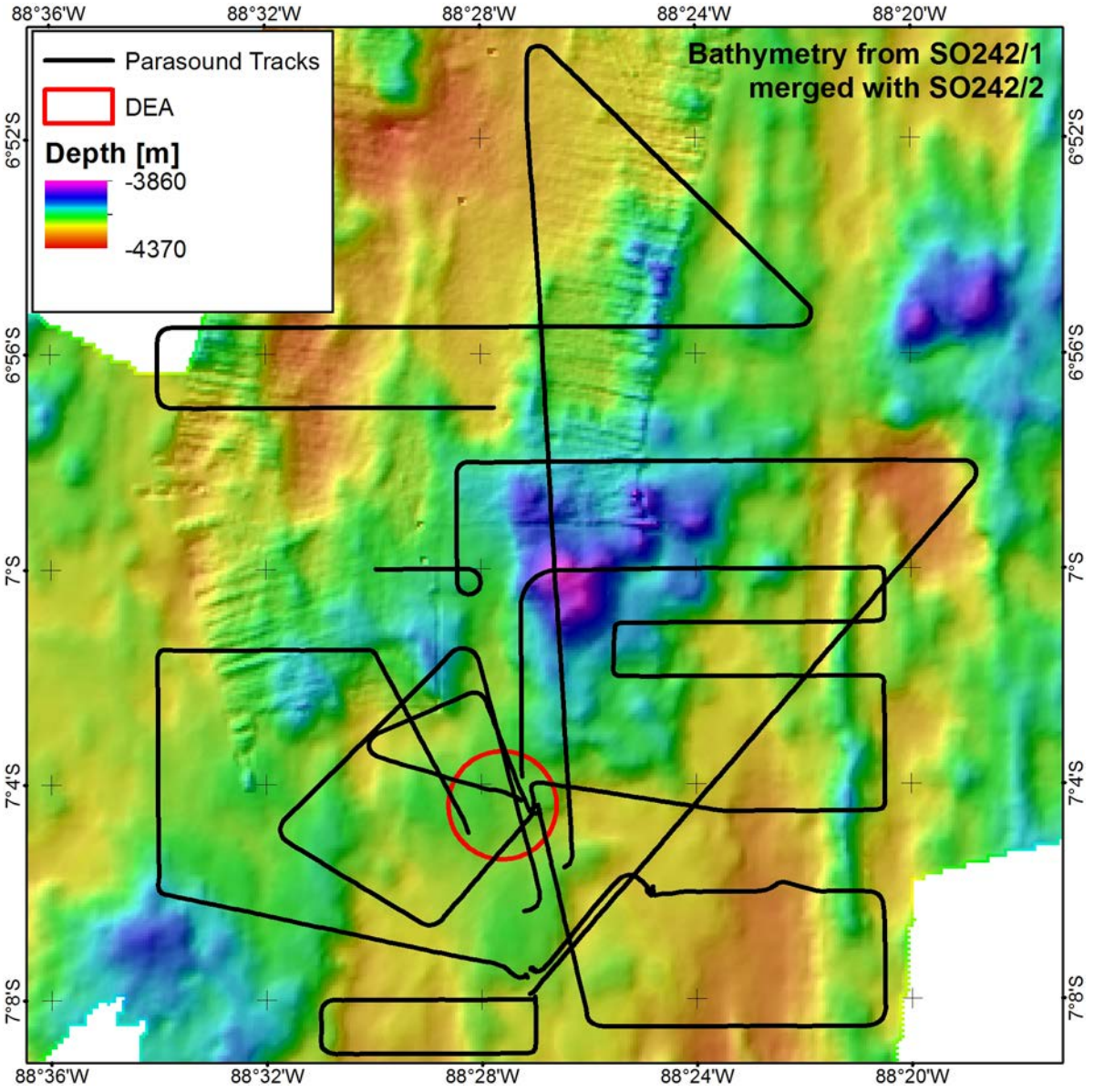


Figure 7.1.2. *Map showing the location of Parasound-surveys during SO242/2*

The data were stored in Atlas .asd-format and .ps3-format for further processing. Further processing was done using the software SeNT, which enables the application of filters (mean, noise) and clipping and allows to add a header information to the output .bmp-file.

7.2 CTD & MAPR & in situ pumps

J Barz, F Janssen, S Müller, S Roessler, R Stiens, T Vonnahme

7.2.1 CTD

The onboard CTD (Conductivity-Temperature-Depth) of RV Sonne is a Sea-Bird Electronics Inc. SBE 911plus system. The unit is equipped with duplicate sensors for temperature (SBE3plus, S/N 5708 and S/N 5938) and conductivity (SBE4C, S/N 4261 and S/N 4262), a pressure sensor (Digiquartz 410K-134, S/N 1184) and is connected to a SBE 32 carousel water sampler with 24 12-liter Niskinbottles. Additionally, an altimeter (Benthos PSA-916, S/N 62237), Fluorescence / Turbidity sensor (WETLabs FLNTU, S/N 1220), a PAR sensor (QCP2300-HP, S/N 70549) and two dissolved oxygen sensors (SBE43, S/N 2811 and S/N 2813) are mounted. The computation of oxygen concentration requires temperature, salinity and pressure which are measured by the CTD system.

During SO242/2 a total of 12 CTD casts were made to collect water samples, to carry the insitu pumps and to monitor the temporal development of the Oxygen-Minimum-Zone (OMZ) in the investigation area (Table 7.2.1). 6 bottom-CTDs were made and stayed between 6 and 7 meters above the bottom for a timespan between 2:15 and 4:30 hours for the operation of the insitu pumps. The other 6 CTDs were solely for the investigation of the OMZ-development.

Table 7.2.1. Overview of the CTD casts during SO242/2

CTD	Station	Maximum Depth [m]	Water samples	Insitu pumps time [hours:minutes]
1	SO242/2_138-1	4124	24	03:15
2	SO242/2_149-1	1499	0	-
3	SO242/2_152-1	1498	0	-
4	SO242/2_157-1	4124	15	03:00
5	SO242/2_167-1	1001	9	03:00
6	SO242/2_172-1	4135	15	03:00
7	SO242/2_190-1	702	9	02:15
8	SO242/2_193-1	4146	24	03:00
9	SO242/2_204-1	2506	3	-
10	SO242/2_207-1	4137	2	03:00
11	SO242/2_209-1	4137	15	04:30
12	SO242/2_224-1	4198	14	-

The raw CTD-data were processed using the software SBEDataProcessing (Sea-Bird Electronics Inc.). Averaged parameters for the closed bottles were created and the downcast measurements were averaged to 1 dB-interval. A typical profile is shown in Figure 7.2.1.

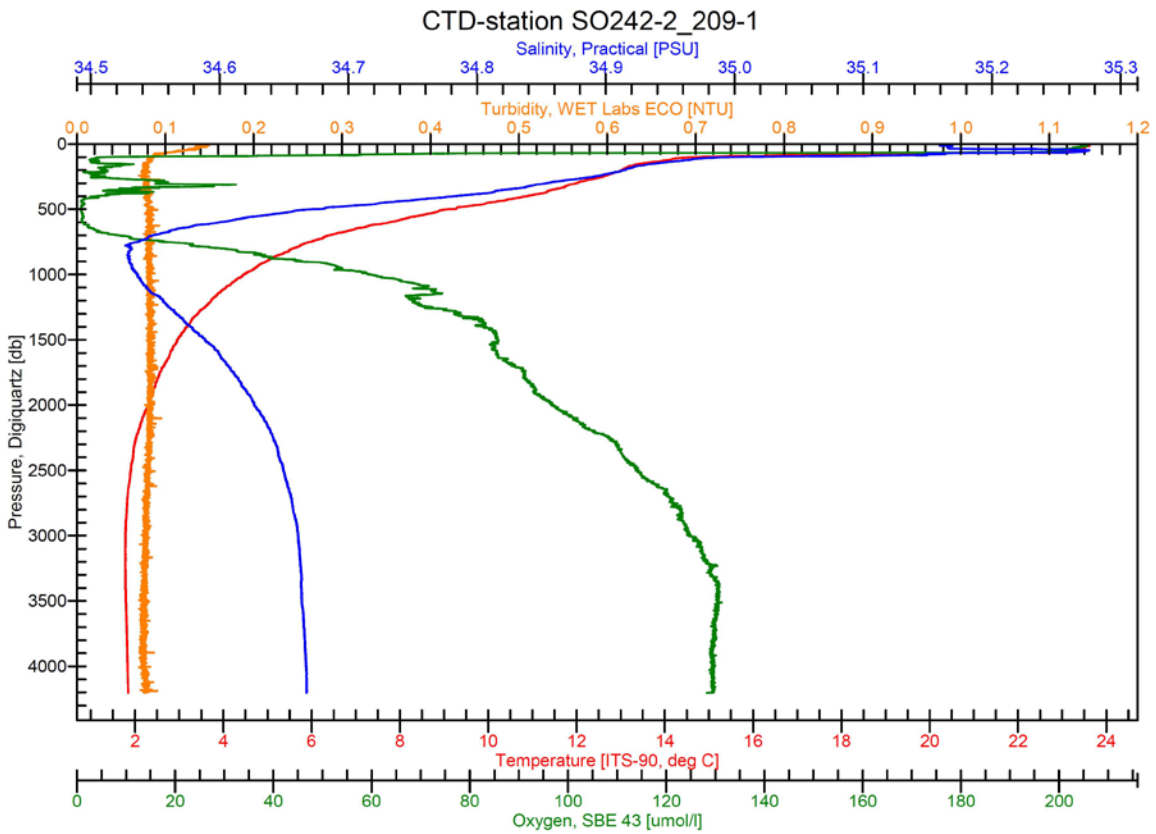


Figure 7.2.1. *Profile of CTD-cast SO242/2_209-1 showing Temperature, Salinity, Oxygen and Turbidity*

The OMZ was located between 400 and 600 m depth with Oxygen-concentrations lower than 5 µmol/l. However, another OMZ was located between 100 and 200 m which concentrations varying during the cruise (Figure 7.2.2).

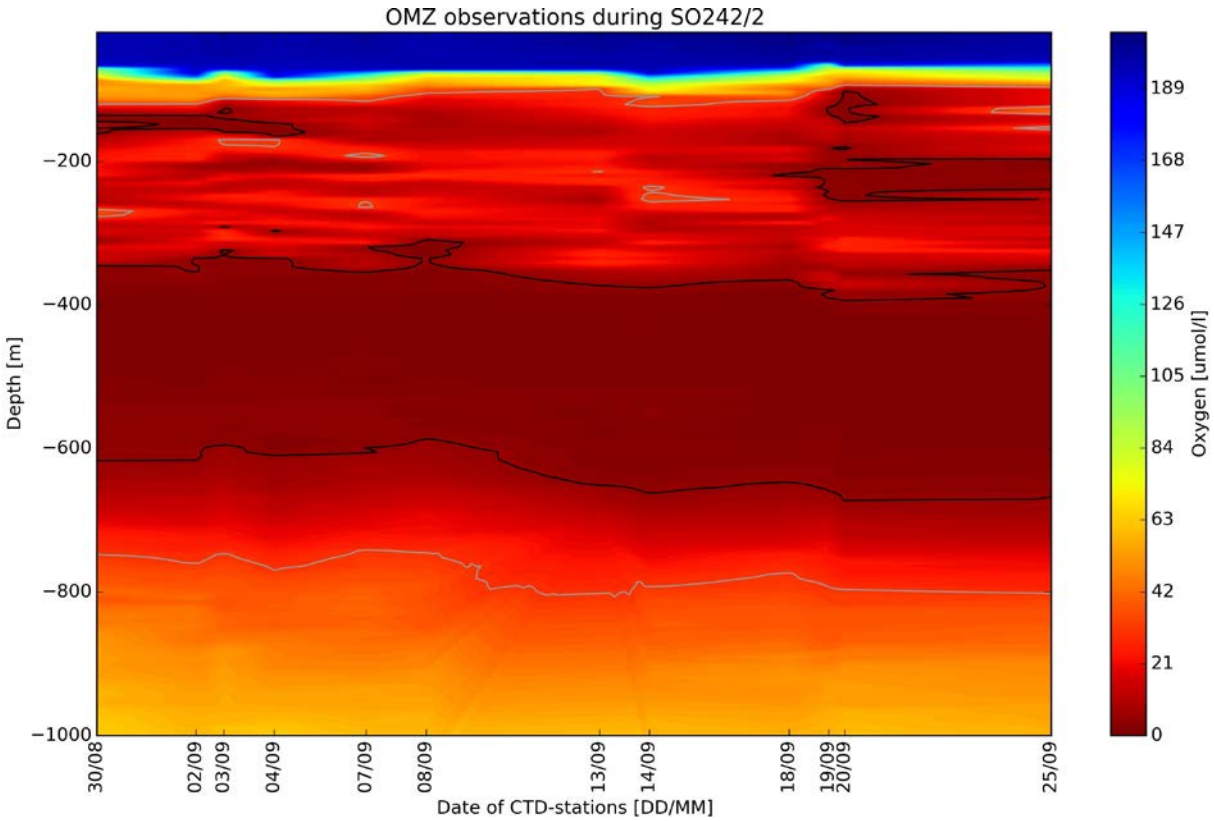


Figure 7.2.2. *Linear interpolated Oxygen-concentrations of the upper 1000 m water depth; the black lines show the 5 µmol/l, the grey lines the 30 µmol/l isocline*

7.2.2 Oxygen determination of CTD/Rosette water samples

Water from the Niskin bottles of the CTD/Rosette is sampled into 55 ml glass bottles with glass stoppers and exactly known volumes. The fixation of the dissolved oxygen is done according to the Winkler method (see Grasshoff et al “Methods of Seawater Analysis” Chapter 4).

The titration is done with an automated titration setup (Metrohm 721 NET Titrino with Pt Titrode controlled by tiamo software) potentiometricaly. Triplicate samples are measured for each CTD/Rosette Niskin bottle (Table 7.2.2).

Table 7.2.2. *Result of the oxygen titration for the CTD casts*

Station	Niskinbottle #	waterdepth [m]	c(Oxygen) [µmol/l]	comment
SO242/2_138	2	4124	143.98	CTD at bottom
	4	4120	143.87	CTD 10 m aboveground
	6	4110	144.52	CTD 20 m aboveground
	8	4090	135.94	CTD 40 m aboveground
	10	4030	143.57	CTD 100 m aboveground
	24	420	5.10	O_2minimum
SO242/2_157	1	4124	144.71	CTD at bottom
	4	4114	144.39	CTD 16 m aboveground
	7	4101	143.80	CTD 29 m aboveground
	10	4080	146.36	CTD 50 m aboveground
	13	4030	143.26	CTD 100 m aboveground
SO242/2_167	1	600	11.92	End O_2minimum
	4	420	3.92	Max O_2minimum
	7	140	16.34	First O_2minimum
SO242/2_172	1	4135	144.68	CTD at bottom
	4	4128	144.15	CTD 13 m aboveground
	7	4115	143.88	CTD 26 m aboveground
	10	4095	143.60	CTD 46 m aboveground
	13	4041	143.73	CTD 100 m aboveground
SO242/2_190	1	600	11.10	End O_2minimum
	3	600	8.61	End O_2minimum
	4	420	5.78	Max O_2minimum
	7	140	25.16	First O_2minimum
SO242/2_193	3	4146	145.58	CTD at bottom
	6	4139	145.41	CTD 13 m aboveground
	9	4126	145.05	CTD 26 m aboveground
	16	4106	145.05	CTD 46 m aboveground
	19	4052	145.32	CTD 100 m aboveground
SO242/2_204	1	600	7.71	End O_2minimum
	2	420	5.87	Max O_2minimum
	3	130	20.96	First O_2minimum
SO242/2_224	1	4198	147.33	CTD at bottom
	12	600	6.38	End O_2minimum
	13	420	7.28	Max O_2minimum
	14	120	53.38	First O_2minimum

The comparison between Oxygen concentrations derived from titration and the CTD sensors shows an offset of 4.8 µmol/l which has to be added to the CTD measurements (Figure 7.2.3).

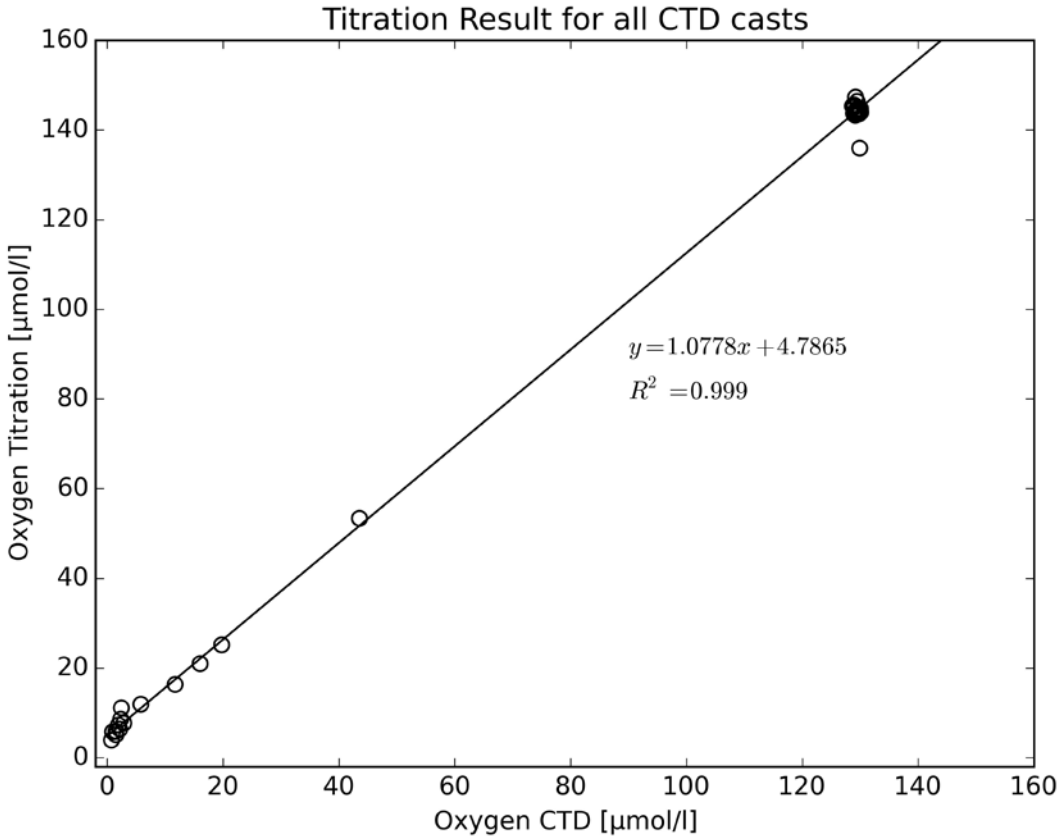


Figure 7.2.3. *Comparison between Oxygen concentrations derived from titration and the CTD sensors*

7.2.3 CTD Filtration

The water from the CTD-Niskin bottles was filtrated at 4°C with a vacuum filtration device for chlorophyll a, fluorescent in situ hybridisations (FISH), DNA and seston analyses.

We used pre-weighed and annealed GF/F filters for chlorophyll a and seston with 0,7µm pore size and 0,8µm cellulose nitrate filters as support filters. For DNA and FISH we used 0,22µm polycarbonate filters and 0,45µm cellulose nitrate filters as support filters.

The FISH samples were fixed with 2% formaldehyde at 4°C for approximately 4 h. DNA, seston and chlorophyll a samples were directly filtrated.

Afterwards the filters were frozen and stored at -20°C for the analyses back in Germany.

Table 7.2.3. *CTD filtration sampling list.*

station	depth [m]	method	Volume filtered [L]
SO242/2-138	4124	Seston DNA	~4,0 9,85
	4120	Seston DNA	~4,5 3
	4110	Seston DNA	~6 3
	4090	Seston DNA	8,56 9,58
	4030	Seston DNA	2 8,95
	4120	DNA	6
	4110	DNA	6,25
	4030	Seston	8,39
SO242/2-157	4124	Seston DNA	8,88 8,0
	4114	Seston DNA	2,0 9,6
	4101	Seston DNA	9,8 9,95
	4080	Seston DNA	8,5 9,55
	4030	Seston DNA	8,0 9,7
	4114	Seston	7,75
SO242/2-167	600	Chl.a Seston DNA Seston	9,9 3,0 3,0 2,9
	420	Chl.a Seston	9,64 9,75
	140	Chl.a Seston	9,89 10
SO242/2-172	4135	DNA Seston	10 10
	4128	DNA	9,8
	4115	DNA	9,825
	4095	DNA	9,0
	4041	DNA Seston	10 9,7
SO242/2-193	4146	DNA Seston	9,6 9,8
	4139	DNA	9,7

Table 7.2.3 continued. *CTD filtration sampling list.*

station	depth [m]	method	Volume filtered [L]
SO242/2-193 ctd	4126	DNA DNA Seston	3 4,55 9,85
	4114	DNA	9,45
	4106	Seston DNA	9,75 9,3
	4052	Seston DNA	10,0 8,42
SO242/2-209	4137	FISH Seston DNA	2,05 10 7,65
	4126	FISH DNA	2,05 9,35
	4115	FISH DNA	2,05 9,15
	4095	FISH DNA	2,15 9,3
	4041	Seston DNA	6 9,3
SO242/2-224	4198	FISH Seston DNA	1,05 8 10

7.2.4 MAPR

The MAPR was deployed 32 times (Table 7.2.4), most of the records of temperature, pressure, turbidity and oxygen reduction potential (ORP) were achieved during ROV dives.

Table 7.2.4. *MAPR deployments*

Station ID	device to which MAPR was attached	Station ID	device to which MAPR was attached	Station ID	device to which MAPR was attached
SO242/2_138	CTD	**SO242/2_172**	CTD	**SO242/2_205**	ROV
SO242/2_139	OFOS	**SO242/2_176**	ROV	**SO242/2_207**	CTD
SO242/2_142	ROV	**SO242/2_179**	ROV	**SO242/2_208**	MUC
SO242/2_151	MUC	**SO242/2_183**	ROV	**SO242/2_211**	ROV
SO242/2_153	Launcher	**SO242/2_188**	ROV	**SO242/2_213**	ROV
SO242/2_154	ROV	**SO242/2_190**	CTD	**SO242/2_216**	ROV
SO242/2_155	OFOS	**SO242/2_191**	ROV	**SO242/2_219**	ROV
SO242/2_157	CTD	**SO242/2_194**	MUC	**SO242/2_222**	ROV
SO242/2_163	ROV	**SO242/2_196**	ROV	**SO242/2_224**	CTD
SO242/2_166	ROV	**SO242/2_198**	ROV	**SO242/2_232**	ROV
SO242/2_169	ROV	**SO242/2_202**	ROV	**SO242/2_235**	LBLrec

The turbidity sensor was occasionally not working while the ORP was occasionally working. The data shows a distinct maximum of -98 mv in oxygen reduction potential at a depth of 479 m below water surface (Figure 7.2.4), tightly resembling the measurements of oxygen concentration recorded by the CTD.

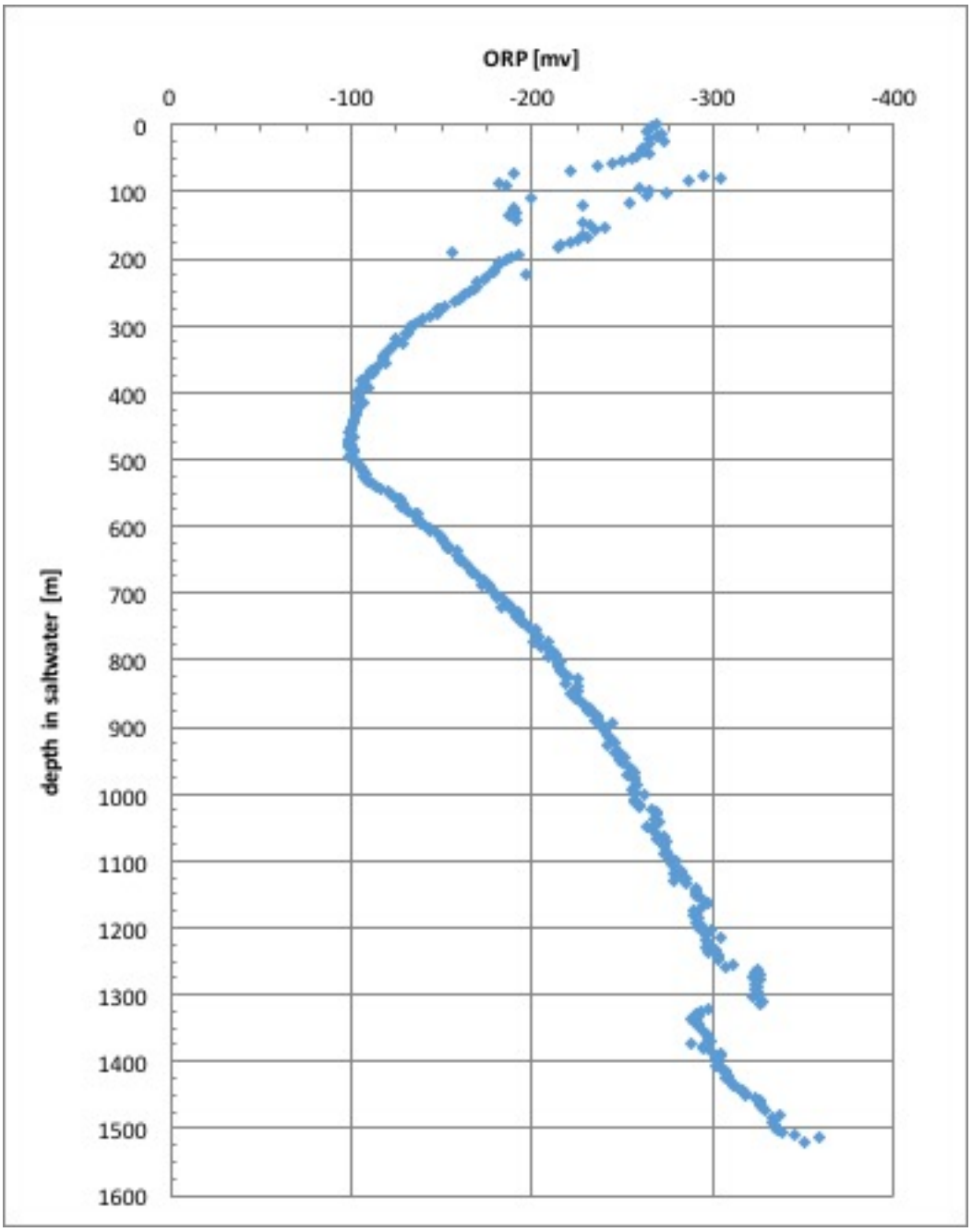


Figure 7.2.4. *One of the few useful records of oxidation reduction potential of the upper water column at station 198.*

Furthermore, the MAPR was used during the plume experiment. Figure 7.2.5 shows the ΔNTU values in relation to the experiment events. Particular background before and after the experiment is low. A close correlation between measured turbidity and time of plume existence is not obvious since the ROV left the plume several times. However, fling back into the plume causes the turbidity to increase and showing decreasing peak height towards the end of the experiment. The more interesting relation is the one of turbidity and oxygen concentration over time. Since the reduction potential measurements of the MAPR where not reliable, oxygen measurements where conducted with standalone sensors.

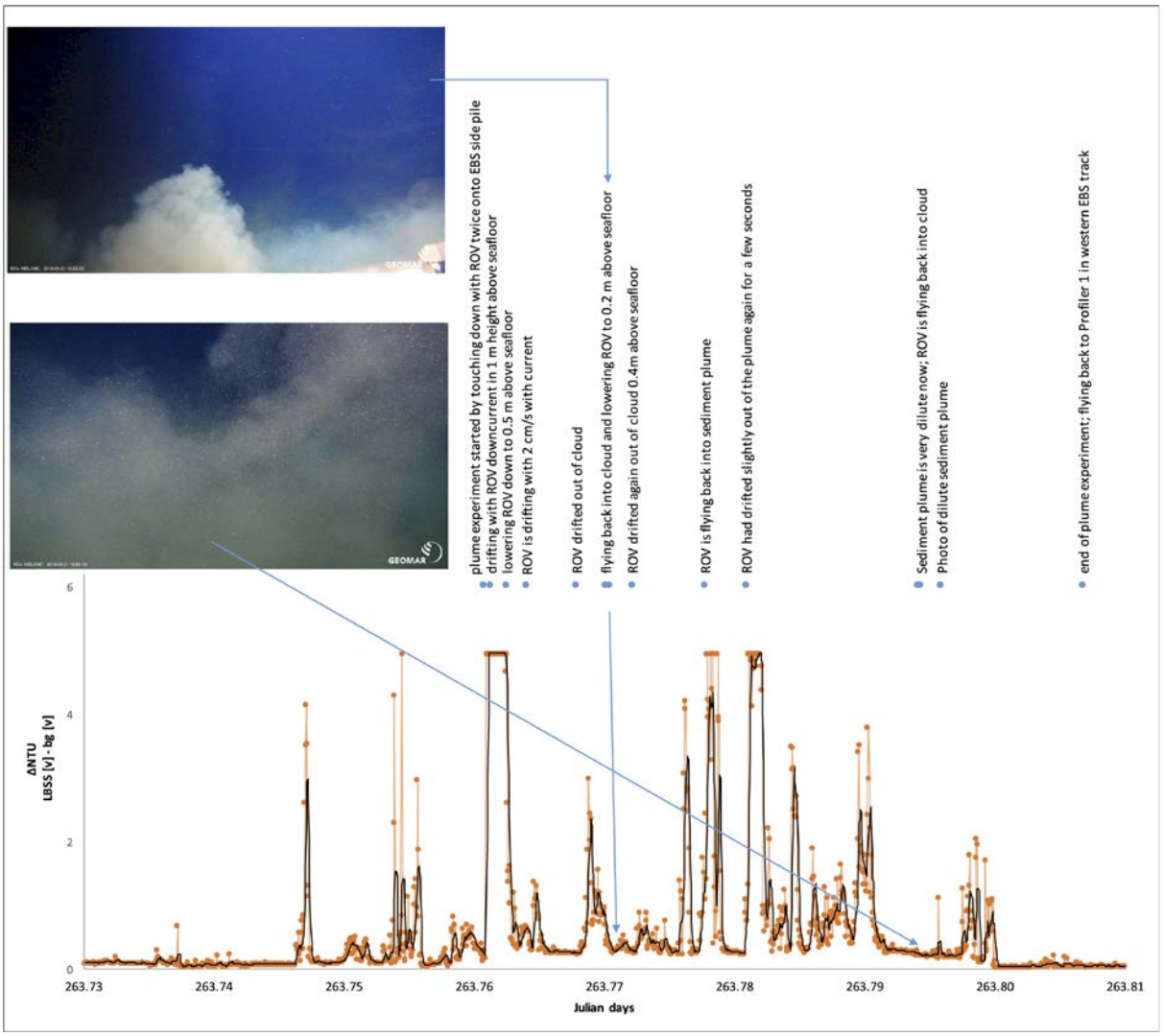


Figure 7.2.5. *Turbidity and events during plume experiment at the EBS track station 213.*

7.2.5 In situ pumps

During several CTD measurements three In situ pumps (McLane Research Laboratories; ML11581-01; Software version lv04-1_5.c) were attached to the wire at distances of about 20 m, 30 m, and 50 m above seafloor for sampling in the Benthic Boundary Layer. In order to sample particles in and above the oxygen minimum zone additional measurements were performed at water depths of approx. 150 m, 400 m, and 600 m water depth. Pre-weighed glass microfiber filters (GF/F) were used to filter seston while cellulose acetate (CA) filters were used to filter particles for later measurements of metals and for DNA extractions. The in situ pumps were running between 2.5h and 4.5h and pumped between 170 l and 1400 l. The first deployment at the 30th of September was used as a reference filtration for an undisturbed environment. Later measurement were done to address the effect of sediment plumes created by the sampling activities on the amount of seston and metals in the lowermost water layer, as well as on the community composition of microorganisms. Similar biogeochemical, geochemical, and microbiological investigations will be carried out on samples obtained in the oxygen minimum zone (OMZ). All filters were stored at -20°C after the filtration and will be analysed later.

Table 7.2.4. *Sampling list for in situ pumps. The usual pump time was 3 hours if not stated differently. The samples were taken as close as possible to the sea floor if not stated differently. Further specifications of the stations are given in table 7.2.1.*

cruise	station	pump	filter type	distance above CTD	Volume filtered [l]	comment
SO242-2_	157	Frauke	GF/F	40	1005.40	Pump time
		Jimmy	GF/F	20	1033.42	3:15h
		Hulda	GF/F	7	999.35	
SO242-2_	167	Frauke	CA	7	711.66	OMZ station
		Jimmy	CA	187	190.41	CTD was at
		Hulda	CA	467	415.64	600m
SO242-2_	172	Frauke	GF/F	9	948.62	
		Jimmy	GF/F	22	973.61	
		Hulda	GF/F	42	966.42	
SO242-2_	190	Frauke	GF/F	14	1065.59	OMZ station
		Jimmy	GF/F	194	720.36	CTD was at 600m
		Hulda	GF/F	484	730.96	runtime only 2:15h
SO242-2_	193	Frauke	GF/F	9	949.76	
		Jimmy	CA	12	185.49	
		Hulda	GF/F	30	907.36	
SO242-2_	207	Frauke	CA	40	243.02	
		Jimmy	CA	20	168.83	
		Hulda	CA	9	269.14	
SO242-2_	209	Frauke	GF/F	40	1227.99	long runtime
		Jimmy	GF/F	20	1241.61	(4:30h)
		Hulda	GF/F	9	1395.30	
SO242-2_	224	Frauke	GF/F	NA	~2	blank for weight of salts
		Jimmy	GF/F	NA	~2	filtration
		Hulda	GF/F	NA	~2	manually on board

7.3 Landers and Moorings

P Linke, A Sweetman, F Wenzhöfer

7.3.1 MPI-Benthic Flux Lander System

Two MPI-Benthic Lander systems were used to quantify benthic exchange and mineralization rates in situ with at five selected stations (see Flux Lander section of Table 7.8.1). Each of the two Lander systems was equipped with three benthic chamber modules and a two-axis Microprofiler (vertical profiling and lateral translation). The benthic chambers were used to measure total oxygen uptake (TOU) and dissolved inorganic carbon (DIC) as well as nutrient exchange of the sediment integrating all relevant solute transport processes (diffusion, advection and fauna-mediated transport) and an area of 400 cm^2. During the deployment an oxygen optode measured changes in oxygen concentration and 7 syringes took water samples at pre-programmed time intervals for analyses of DIC and nutrients. Furthermore, the enclosed sediments were retrieved and sampled on board for total organic carbon (TOC) and photopigment content, and for abundances of micro-organisms, meio-, and macrofauna. The X-Y microprofiler was used to quantify diffusive oxygen uptake (DOU), which is generally assigned to microbial respiration. Each microprofiler was equipped with a total of eleven microsensors measuring vertical distributions of oxygen (6 sensors), pH (2), NOx (2), and resistivity (1). Measurements across the water-sediment interface and within the upper sediment layer were performed with a vertical resolution of 150 to 250 µm and extending over a total length of 15-25 cm. During the deployments the microprofiler performed five vertical profiles. The profiling unit was translated laterally by 9 cm between replicate profiles to avoid profiling of the same sediment patch.

7.3.2 The IRIS lander

The IRIS lander is being used to assess seafloor respiration and estimate C and N flow through the food-web in disturbed areas within the DEA and undisturbed areas in the southern reference area. The lander is being deployed autonomously at the sea surface in the reference areas and by the GEOMAR launcher within the DEA. When it reaches the seafloor, the chambers are pushed into the sediment for a pre-set period of time via an onboard computer. During this time, oxygen concentrations are measured inside the chambers by Contros Hydroflash O_2 optodes. By measuring the concentration of oxygen in water samples over time it is possible to measure the flux of O_2 and thereby measure the respiration rate at the seafloor. At the same time as the lander is measuring seafloor respiration, we are injecting isotope labeled substrates over the sediment enclosed by the chambers. The uptake of labeled elements will then be traced into sediment-dwelling organisms and abiotic components, making it possible to quantify the uptake and turnover of specific elements and assign the organisms and pathways responsible. This then allows a picture to be generated of the biological and geochemical processes currently taking place at the seafloor to be determined for the different study sites.

Figure 7.3.1. *The IRIS lander being deployed.*

A total of 3 lander deployments were made in the reference area and 1 in the DEA area. The 3 lander deployments in the reference area last 3-3.5 days and were made up of 3 isotope algal injection experiments and 3 controls (in the absence of algae). The DEA experiment was precisely guided to a 26yr old track with the GEOMAR launcher and released over the track. It comprised 2 algal injection experiments and 1 control. Respiration rate (sediment community oxygen consumption) and nutrient flux rates were measured on all deployments, and samples for bacterial, meiofauna and macrofauna diversity, and C-uptake and sediment chemistry (POC, density, etc).

7.3 SO242/1 Mooring and Lander recovery

A thermistor mooring and BoBo lander deployed by SO242/1 were successfully retrieved during SO242/2. Please see SO241-1 cruise report for more information.

7.4 ROV KIEL 6000 operations

F Abegg, M Bodendorfer, P Cuno, J Hennke, F Janssen, P Linke, A Meier, S Nornes, M Pieper, M Plöger, R Schwarz, I Suck, F Wenzhöfer

7.4.1 Deployment of ROV KIEL 6000 during expedition SO242/2 onboard RV Sonne in the DISCOL area off Ecudor in the southern tropical Pacific Ocean

ROV KIEL 6000 is a 6000 m rated deep diving platform manufactured by Schilling Robotics LLC, Davis, USA. It is based on commercially available ROVs, but customized to research demands, e.g. being truly mobile. As a truly versatile system it has been operated from a variety of different national and international research vessels (RV Sonne, N/O l'Atalante, RV Maria S. Merian, RV Meteor, RV Celtic Explorer, RRS James Cook and RV Polarstern) until today. It is an electrically driven work class ROV of the type QUEST, build No. 7. ROV KIEL 6000 is based at the Helmholtz Centre for Marine Sciences GEOMAR in Kiel, Germany.

Including this cruise, ROV KIEL 6000 has accomplished 236 dives during 20 missions. During SO242/2, 22 scientific dives and one "rescue" mission (Table 7.4.1) could be accomplished. Maximum diving depth was more than 4100 m and maximum bottom time was 10:37 hours. In total, bottom time accumulated to approximately 179 hours (total dive time approx. 252 hours).

7.4.2 ROV Tasks during SO242/2

Tasks of ROV KIEL 6000 included sediment sampling, mainly using pushcores (fig. 7.4.2a), as well as the deployment and handling of experimental tools such as benthic chambers (fig. 7.4.2b), profilers (fig. 7.4.2d), InCUBEators (fig. 7.4.2g), Respiration Chambers, various kinds of scoops (fig. 7.4.2h) and nets. The so-called slurp gun/suction sampler was used to "suck" various animals, mainly holothurians and isopods from the seafloor and either get them in a slurpgun container or "spit" them into a bio box or into experimental setups (e.g. respiration chambers). Also, a lot of video and photo footage from all kinds of disturbed and undisturbed seabed as well as various animals was taken.

The standard configuration consisted of 16 pushcores in the portside drawer, the Senckenberg Biobox on the starboard drawer, the slurpgun, handnet and nodule scoops (fig. 7.4.1)

Figure 7.4.1. *Standard sampling device configuration with 16 pushcores on the portside drawer and the Senckenberg Biobox on the starboard drawer.*

Additional sampling devices mounted on the ROV were Niskin Bottles for water samples during plume experiments, two “larvae pots” for taking up holothurians after slurping them from the InCUBEators (less stress than pumping them to the usual slurpgun containers), a front box on the portside drawer with a small lidded biobox and space for transporting blade corers. If necessary, the starboard drawer was modified to carry plastic bottles, containing experimental sediments, or our pushcore sixpacks.

To handle all the equipment, i.e. to get it down to the seafloor and back up again, two GEOMAR elevator systems were deployed parallel. (fig. 7.4.2c, see also 7.4.2)

Further tasks were the documentation of the performance of the newly developed crawler Tramper (fig. 7.4.2j), which on one occasion led to a “rescue” by placing a hook on a ships wire onto the crawler to get it back up after it could not be released.

A Hyperspectral Camera was integrated into the ROV system (more details 7.4.5) and successfully tested.

The last dive was needed to try locating a lander which could not be released remotely. This lander was deployed in free fall mode, so that there was no precise position on the seafloor available. A range of 200m in all directions around the release position was investigated but no trace of the lander could be found.

***Table 7.4.1**. ROV station list SO242/2.*

Station Number SO242/2	Dive No.	Date (UTC)	Time Start (UTC)	At Bottom (UTC)	Off Bottom (UTC)	Time End (UTC)	Location	Depth (m)	ROV Bottom Time
Test	213	28.8.15	Harbour Test Guayaquil, Ecuador						
142	214	31.8.15	13:13	14:56	21:05	22:50	DEA disturbed West	4130	06:09
146	215	1./2.9.15	13:34	15:10	00:34	02:00	DEA disturbed West	4130	09:24
150	216	2./3.9.15	13:53	15:22	22:36	00:10	DEA disturbed West	4130	07:14
154	217	3./4.9.15	13:39	15:12	00:07	01:50	DEA disturbed West	4130	08:55
163	218	5.9.15	13:30	15:09	21:56	23:38	DEA disturbed East	4140	06:47
166	219	6./7.9.15	13:25	14:59	23:31	00:08	DEA disturbed East	4140	08:32
169	220	7./8.9.15	13:47	15:20	01:30	02:13	DEA disturbed East	4140	10:10
176	221	9.9.15	13:50	15:11	23:22	00:52	DEA disturbed East	4140	08:11
179	222	10./11.9.15	13:35	15:07	01:44	03:20	DEA disturbed East	4140	10:37
183	223	11.9./12.9.15	15:00	16:30	00:29	02:05	Reference South	4160	07:59
187	224	12./13.9.15	14:47	16:27	23:20	00:54	Reference South	4160	06:53
191	225	13.9.15	14:20	15:59	18:43	20:20	Mooring	4140	02:44
196	226	15./16.9.15	13:46	15:26	23:43	01:20	Reference South	4160	08:17
198	227	16./17.9.15	13:42	15:18	22:11	23:50	Reference South	4160	06:53
202	228	17./18.9.15	13:44	15:30	00:06	01:36	EBS Track	4140	08:36
205	229	18./19.9.15	15:26	17:07	00:16	01:51	EBS Track	4140	07:09
211	230	20./21.9.15	13:42	15:14	22:02	23:40	EBS Track	4140	06:48
213	231	21./22.9.15	13:34	15:10	01:29	03:14	EBS Track	4140	10:19
216	232	22./23.9.15	15:00	16:36	03:12	05:04	Reference South	4160	10:36
219	233	23./24.9.15	16:25	18:05	01:49	03:23	DEA Central	4140	07:44
222	234	24./25.9.15	14:58	16:29	01:00	02:34	DEA Central	4140	08:31
232	235	27.9.15	13:46	15:33	21:56	23:33	DEA Central	4140	06:23
235	236	28./29.9.15	21:14	22:54	03:35	04:59	DOS Lander	3850	04:41
Total: 22 scientific dives + 1 rescue mission (last dive)									**179:32 h**

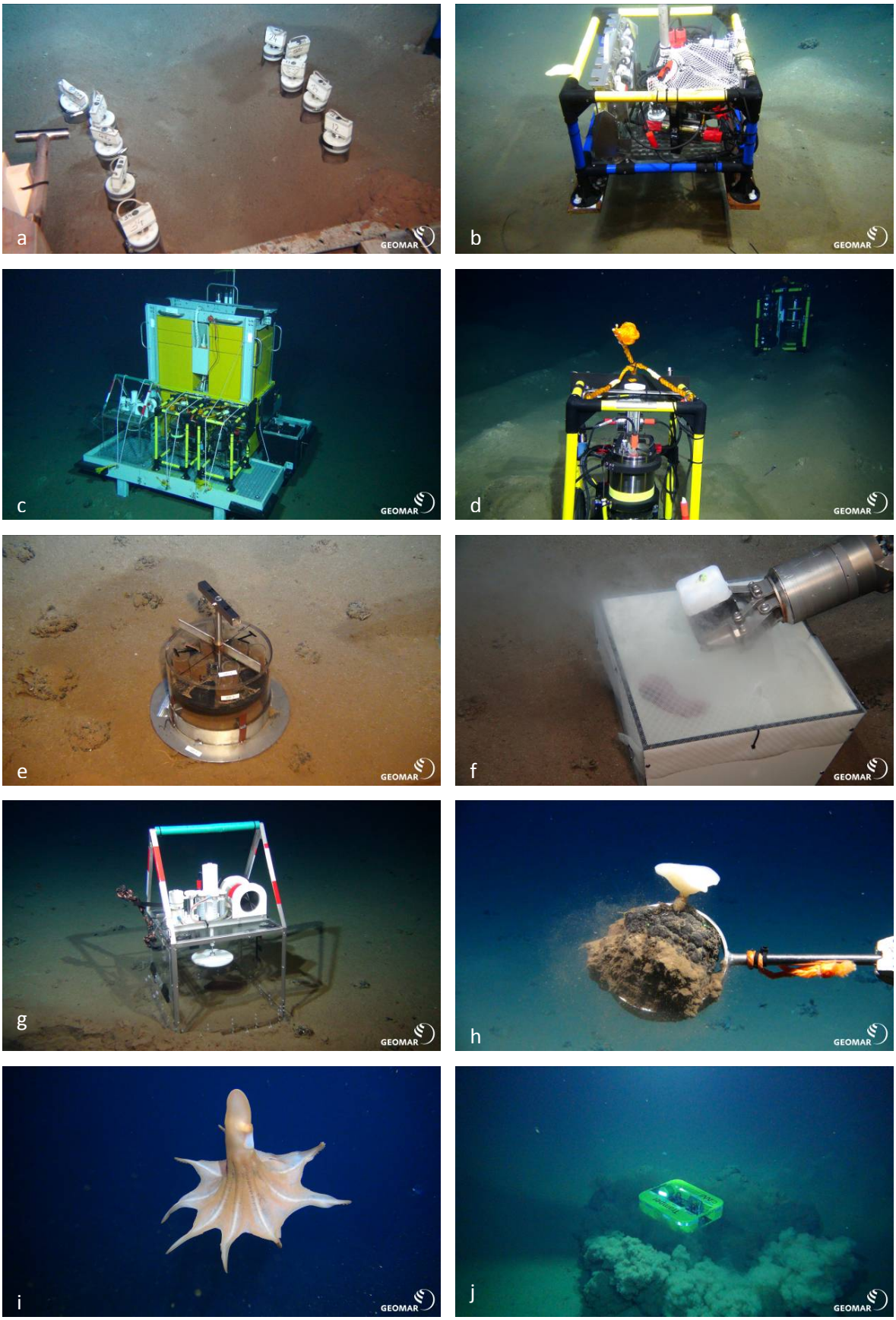


Figure 7.4.2. a) *pushcores on ripple crests;* ***b)*** *benthic chamber being positioned;* ***c)*** *Elevator with profilers,* ***d)*** *profilers in track,* ***e)*** *sediment dispensers,* ***f)*** *experimental sediment being poured into corral,* ***g)*** *InCUBEator with holothurian,* ***h)*** *scooped nodule with sponge,* ***i)*** *cephalopod,* ***j)*** *crawler Tramper has landed.*

Tools used during SO242/2 / handled by the ROV:

- Slurp gun w/ 8 sampling containers (ROV KIEL 6000)
- Push cores (ROV KIEL 6000)
- Handnets (ROV KIEL 6000)
- Lasers (integrated) (Alpha Cam, ROV KIEL 6000)
- “Senckenberg” Biobox (large) (ROV KIEL 6000)
- 5 liter Niskin Bottles (metal-free) (ROV KIEL 6000)
- “Larvae” pots(ROV KIEL 6000)
- MAPR (autonomous)
- Benthic Chambers (MPI)
- Profilers (MPI)
- Nodule Chamber (MPI)
- HOMER Beacons (MPI)
- Passive markers (MPI)
- InCUBEators (NIOZ)
- Respiration Chambers (NOCS)
- Hyperspectral Camera (NTNU)
- Oxygen Sensors (MPI / IRIS)
- Blade Corers (MPI)
- Ekman Grab (IRIS)
- Corrals (NOCS)
- Sediment bottles (NOCS)
- Sediment dispensers (UGent)
- Nodule Scoops (MPI)
- Rescue Hook (ROV KIEL 6000)
- Elevators (GEOMAR)

7.4.3 In situ biogeochemical modules

ROV-Profiler - Two compact stand-alone 1-axis microprofilers with a small glass fiber reinforced plastic frame were used for investigations of fine scale pore water dissolved oxygen, NOx and pH distributions. The instrument was deployed, started and relocated between profiles by the ROV’s manipulator. Compared to the microprofiler on the Benthic Flux Lander System (see above) this allowed to address specific microenvironments in the disturbance area and to avoid positioning of the delicate sensors on top of nodules. A total of eleven microsensors measuring vertical distributions of oxygen (6 sensors), pH (2), NOx (2), and resistivity (1) were mounted. Measurements across the water-sediment interface and within the upper sediment layer were performed with a vertical resolution of 150 to 250 µm and extending over a total length of 15-25 cm.

ROV-Chamber – Four ROV-operated benthic chambers were used to determine the total exchange rates at specific habitats of the DEA area. The modules were positioned at selected spots by the ROV manipulator. Seven syringes took water samples in pre-programmed time intervals for analyses of dissolved inorganic carbon (DIC) and nutrients. The water height within each chamber was monitored by ROV-photos and video recording. Additionally, bromide was injected at the beginning of

the incubation and its dilution will be analysed in the retrieved syringe samples as a measure of the enclosed volume.

In situ nodule incubation system 'Knolle' – Knolle, a three-chamber nodule incubation module, was used to determine the oxygen consumption of nodules and their associated epifauna and microbial biofilm. The instrument was attached to the elevator system and stayed at the seafloor during the entire incubation. Nodules were collected by the ROV using a circular sieve-like scoop and transferred into the respective incubation chambers. After closing the lids the decrease in oxygen concentration was monitored over time by oxygen optodes in the water body that was gently stirred during the incubation to prevent stagnating conditions. After the incubation the elevator was called back to the surface and the nodules were recovered from the chamber for determination of the weight and volume and to sample the associated fauna.

7.4.4 Elevator operations

To transport ROV-modules, sampling and experimental gear to the seafloor and back to the surface and to increase the efficiency of the ROV's bottom time, two elevator landers were used during cruise SO242/2. Whereas the first elevator has been used already on several cruises together with ROV KIEL 6000, the second one was newly designed in view of the large number and variety of different modules to be used during this cruise. Whereas the old elevator (2) has a frame of stainless steel and two platforms and drawers for samples, the new elevator (Ocean Support Carriage Application – OSCA) has a lighter frame of glass fiber reinforced plastic (GFRP) and an open platform around the floatation. Due to reduction in weight of elevator 1 the payload increased to 230 kg (max.) with more space on the platform (3.6 m^2) compared to the old elevator (2.6 m^2). To keep the elevator lander at the bottom during deployment and removal of the scientific payload, either a train reel (~300 kg, elevator 2) or a block of steel (442 kg, elevator 1) was used. Both elevators were equipped with blocks of syntactic foam for floatation, direction finding beacons for location at the seafloor, dual KUM releasers and manual emergency release with ROV, flasher and radio beacon for relocation on the sea surface during recovery by using a floatation line. They were deployed video-guided by a launcher to ensure a targeted and soft deployment (Fig. 7.4.3).

Figure 7.4.3. *Elevator 1 (left) and Elevator 2 (right) loaded with scientific equipment and ready for deployment by the launcher on top of the landers.*

Due to the length of the ship's hybrid cable (11,000 m with 18 mm diameter), the signal for triggering an electric release could not be transmitted with the available telemetry. Therefore, an acoustic release with a slower response time had to be used on the launcher to separate the lander from the launcher. The release signal was given with the ship's POSIDONIA array when the elevator reached the position approx. 1 m above the seafloor and was clearly visible for the winch operator in the vessel's data center.

During the cruise various equipment in different combination had to be transported by both elevators (Fig. 7.4.3), either to be deployed and put back on the elevator by the ROV (Fig. 7.4.4) and/or used mounted permanently on the elevator and filled with samples by the ROV (Fig. 7.4.5) or attracted by bait. Careful planning was needed to use the available space and payload of both elevators, secure the equipment during descent and recovery as well during ROV operations by the pilots.

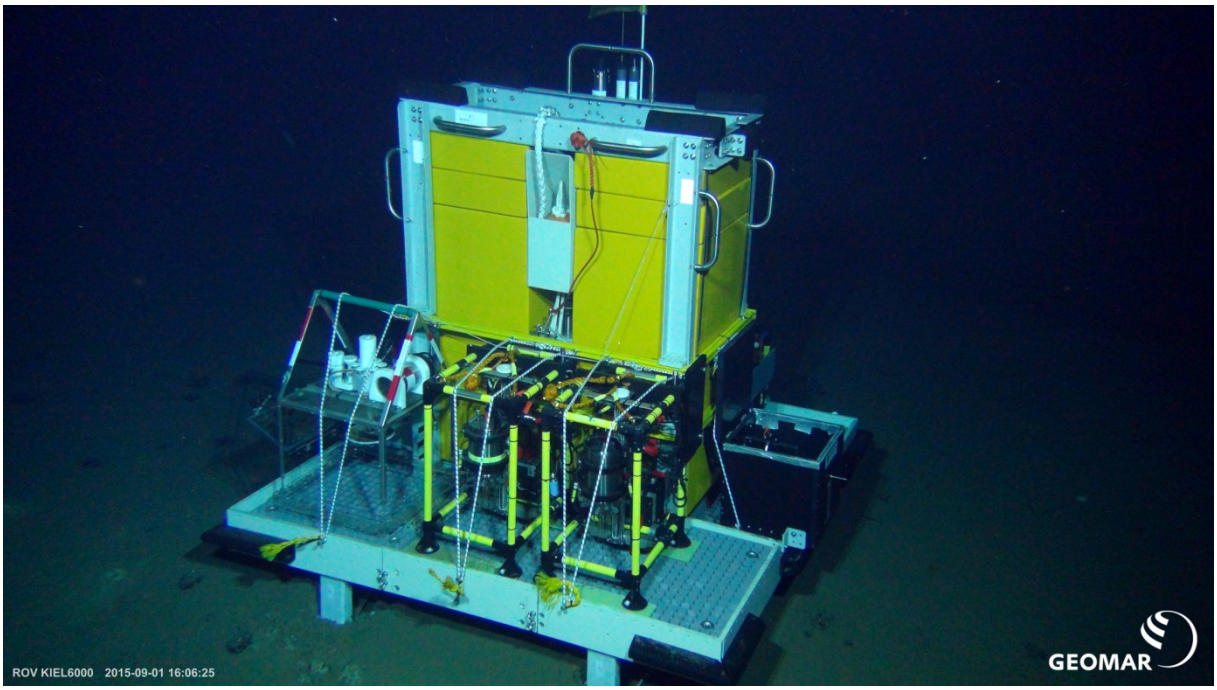


Figure 7.4.4. *Elevator 2 equipped with a respiration chamber and 2 profilers on the porch and an Ekman grab in the box on the right. In the middle of the elevator a box with a flotation line is visible, which can be released by the ROV pulling the orange line to facilitate the recovery of the elevator at the sea surface.*

A total of 13 deployments of Elevator 1 (9) and Elevator 2 (4) were conducted. In some cases the elevators were used in parallel and deployed just some meters apart to reduce the travel time of the ROV.

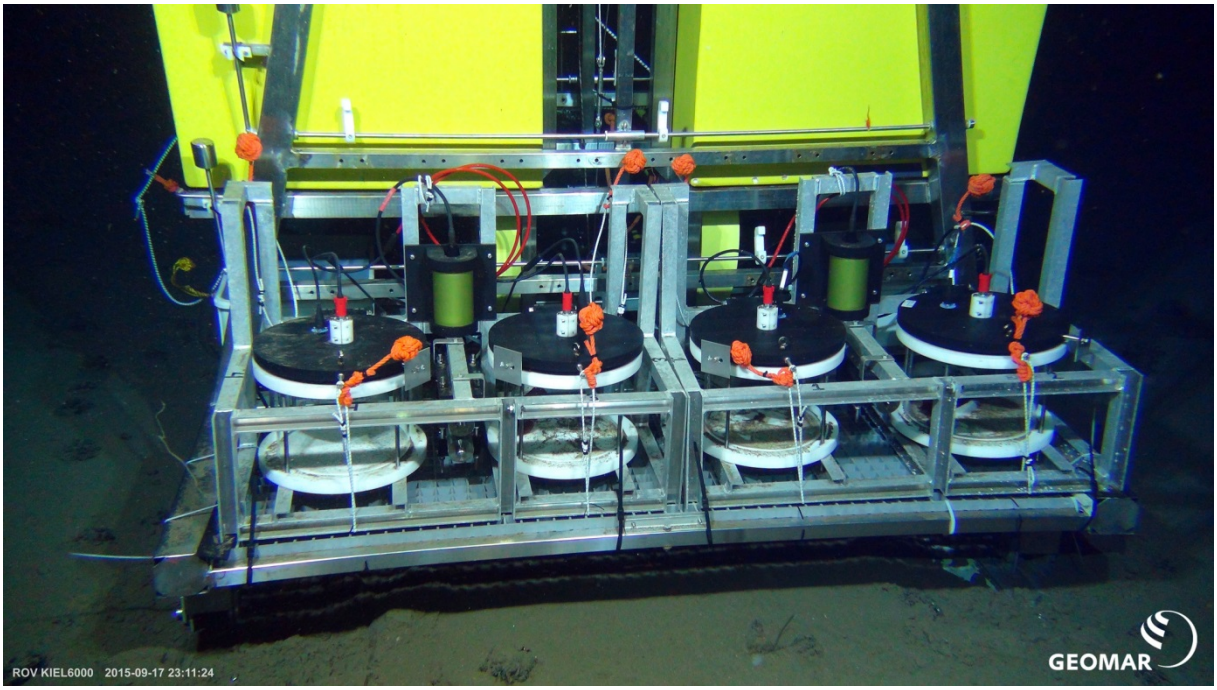


Figure 7.4.5. *Elevator 2 with 4 benthic respiration chambers mounted on the porch. In this case, the ROV sampled holothurians using the slurp gun and placed them gently into the chambers.*

7.4.5 Hyperspectral Imager

The Scientific Underwater Hyperspectral Imager (model UHI_SCI_6000) produced by Ecotone A/S is a brand new sensor tested for deep sea research for the first time during this cruise. It is a line-scanner recording lines of 1600x1 pixels with up to 896 spectral bands ranging from 380nm to 800nm wavelength. It can record at frequencies up to 100 Hz with sufficient lighting. The UHI was mounted vertically on the end of the fully extended Rigmaster arm of the ROV during dive SO242/2-191, and scans were performed by flying the ROV at a fixed altitude over the seafloor at constant speed and heading (fig. 74.6).

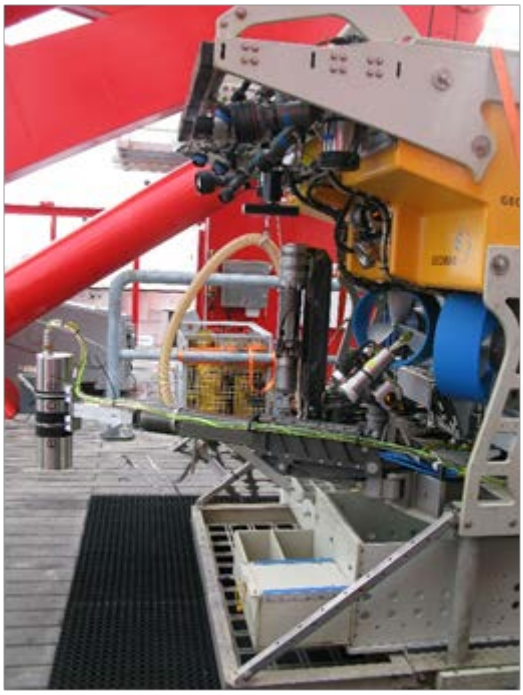


Figure 7.4.6. The hyperspectral camera mounted on the KIEL 6000 ROV prior to deployment.

Results

A total of 15 transects over the seabed were scanned, ranging from 2 to 20 meters in length. Due to lighting conditions being quite low, scans were recorded at 20Hz with 112 spectral bands. The scans covered a wide variety of biological and geological objects of interest. 3 nodules scanned during some of the transects were collected in order to assess the accuracy of the post-processed data. Because the sensor system was finished for delivery to NTNU less than 5 days before departure, not all software necessary for post-processing was ready for the cruise, and all processing is postponed until return to Norway. Unprocessed sample images are shown in fig.7.4.7.

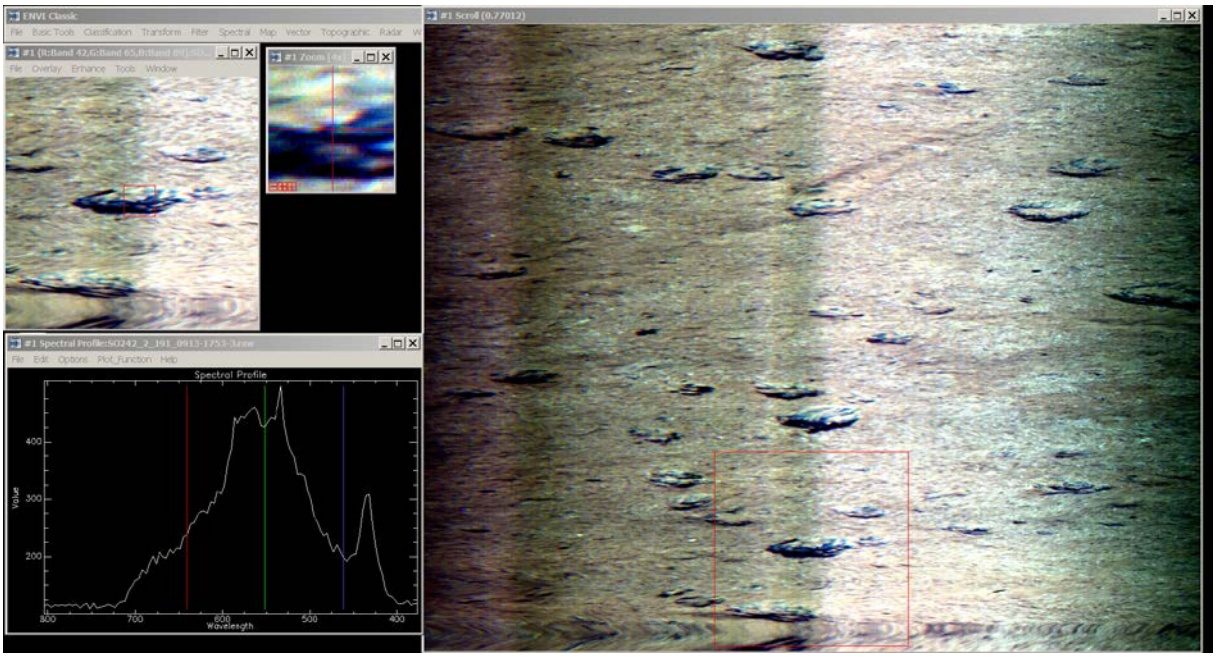


Figure 7.4.7. Unprocessed hyperspectral camera images.

7.4.6 Dive Summaries

Table 7.4.2. *Dive summaries from SO242/2.*

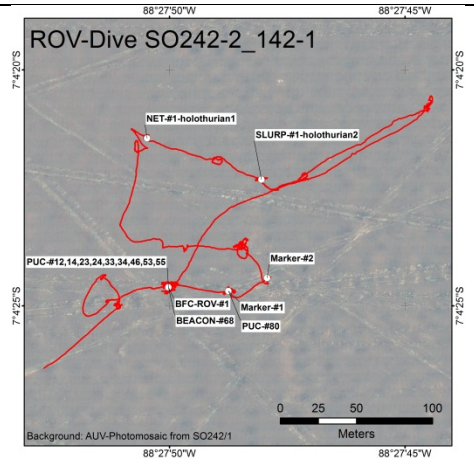
St. #	Date (UTC)	Map	Summary
142	31.08.2015		DEA West Plough Track The old plough tracks were explored, ripples are clearly to be seen from the ploughing of the seafloor, with ripple crests and valleys, and in between some whitish spots that looked like the surface layer of sediment was eroded. We selected these three types of seafloor morphologies as microhabitats to be sampled, in comparison to the undisturbed area outside the track, which showed some partially sedimented nodules. We got the benthic chamber from the elevator, but unfortunately it sank in quite deep and the program did not start. We collected 14 pushcores from the ripple crests and 2 from the valley, placed marker 1 at the sampling spot, and were able to photograph the environment. Marker 2 was placed further away in the track. Another task was trying various sampling tools for fauna, especially holothurians (2 samples with handnet and biobox).

Table 7.4.2 continued. *Dive summaries from SO242/2.*

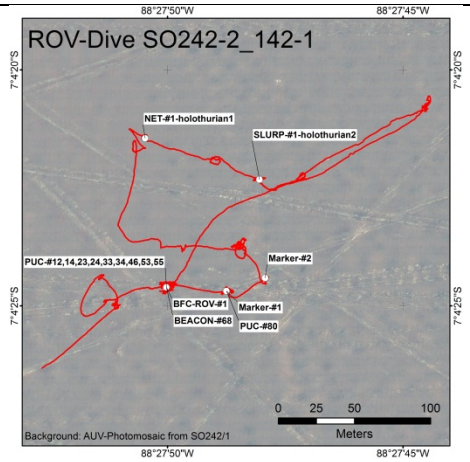
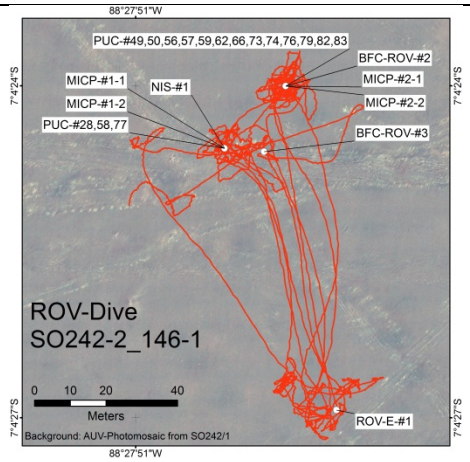
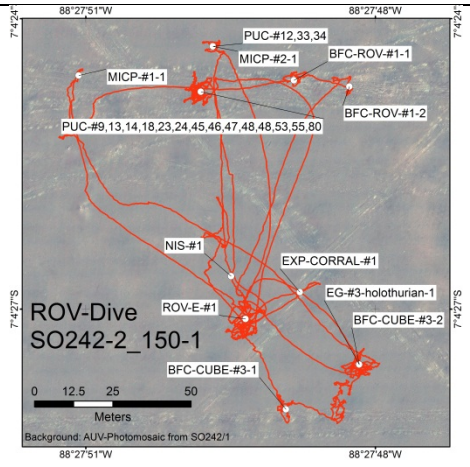
St. #	Date (UTC)	Map	Summary
142	31.08.2015		DEA West Plough Track The old plough tracks were explored, ripples are clearly to be seen from the ploughing of the seafloor, with ripple crests and valleys, and in between some whitish spots that looked like the surface layer of sediment was eroded. We selected these three types of seafloor morphologies as microhabitats to be sampled, in comparison to the undisturbed area outside the track, which showed some partially sedimented nodules. We got the benthic chamber from the elevator, but unfortunately it sank in quite deep and the program did not start. We collected 14 pushcores from the ripple crests and 2 from the valley, placed marker 1 at the sampling spot, and were able to photograph the environment. Marker 2 was placed further away in the track. Another task was trying various sampling tools for fauna, especially holothurians (2 samples with handnet and biobox).
146	01./02.09.2015		DEA West Plough Track During dive 146 two Benthic chambers and two micro profilers were deployed. A third benthic chamber did not work (i.e, the program was not running at all) and therefore taken back to the surface on the porch after the dive. The profilers were redeployed for a second replicate measurement at neighbouring sites during the dive. One of the profilers was redeployed a second time but failed to produce data. In total 16 push cores were taken in the vicinity of the chamber and profiler deployments – 11 at undisturbed sediments off disturbance track and another 5 from valleys. In addition, bottom water in the track was sampled by an ROV Niskin Bottle. Other tasks were to test sediment sampling with a miniature Ekman Grab and to try out a custom-built sediment dispenser of Gent University. Unfortunately neither of the two instruments worked successfully.
150	02/03.09.2015		DEA West Plough Track We started dive 150 by placing the chamber 1 on a whitish spot. CUBE 3 was placed on two locations within the track to test how deep it would sink into the sediment, before it was placed over a purple holothurian and the test deployment was started. Meanwhile the profilers 1 and 2 were moved to new locations and 3 pushcores from the ripple top and 10 pushcores from the ripple valley were taken. When CUBE 3 was recovered, the stirrer still stirred and one of the sampling syringes was released. Unfortunately, the algal injection mechanism did not work, probably as a result of using two septa instead of only one. The sediment inside the area that was previously covered by the CUBE was sampled with Ekman grab 3 that did not work properly. The last task was to press one of the coralls for the ecotoxicology experiments into the sediment and recover it to see whether it can be used by the ROV.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

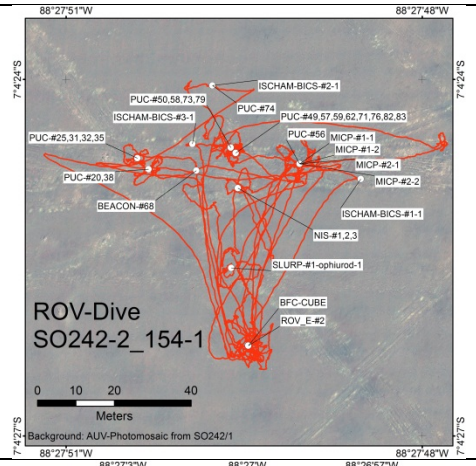
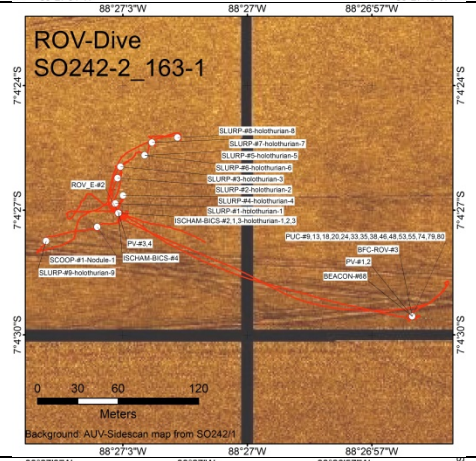
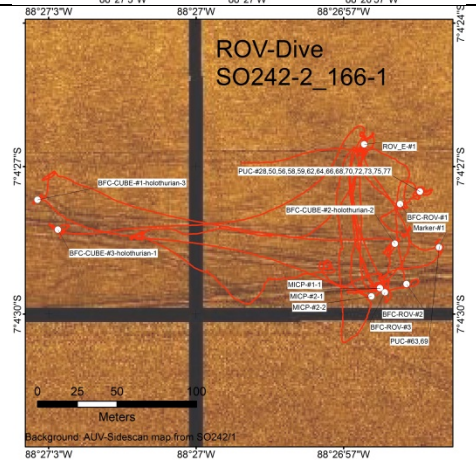
St. #	Date (UTC)	Map	Summary
154	03./04.09.2015		DEA West Plough Track Placement of profilers 1 and 2 on white spots two times (in the beginning and at the end of the dive), sampling with push corers on white spots, ripples and crests from the ploughed area. Placement of beacon # 68 in the Ekman grab box. Chambers 1, 2 and 3 were put back onto the elevator. The profiler 1 did not turn on correctly the second time, so it was fixed on the elevator while profiler 2 stayed at the seafloor. Furthermore, a plume experiment was conducted and samples were collected with a Niskin bottle.
163	05.09.2015		DEA East Plough Track Dive 163 was used to deploy MPI chamber 3 (with beacon 68), take a set of 16 pushcores from a ripple in the plough track, initiate a 4-day BICs incubation with holothurians, slurp holothurians for tissue analysis, collect nodules for the sediment dispenser experiment and test the sediment shakers for the ecotoxicology experiments. Originally, the plan was to start a 4-day CUBE incubation, but the program of two CUBEs (2+3) was unintentionally started during the elevator descent. It was decided to leave CUBE1 on the elevator and bring CUBE2+3 up on the porch for redeployment the next dive.
166	06./07.09.2015		DEA East Plough Track 14 push cores were taken in an undisturbed area including one predrilled core (labeled red). Two extra push cores were taken from a ripple valley. Beacon 68, which was supposed to mark the position for pushcoring, failed as it did not send out any signal and thus could not be found. Instead we orientated ourselves with the help of other waypoints. Profiler 1 was placed on the seafloor, its lamp started blinking, but the motor did not start turning. The deployment of Profiler 2 on the other hand was successful as its motor started turning. However, Profiler 2 could not be replaced for a second measurement, since its sensors were broken after the first profiling.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

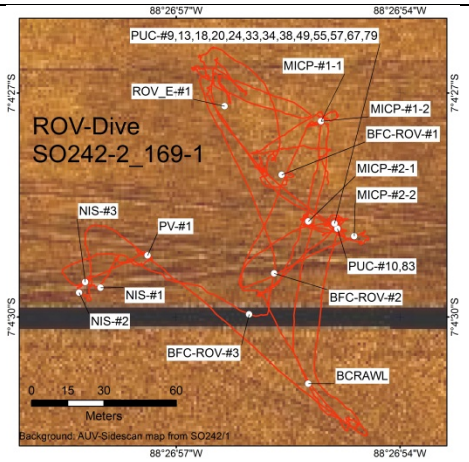
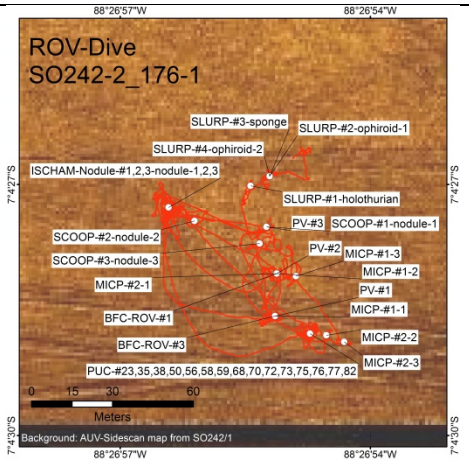
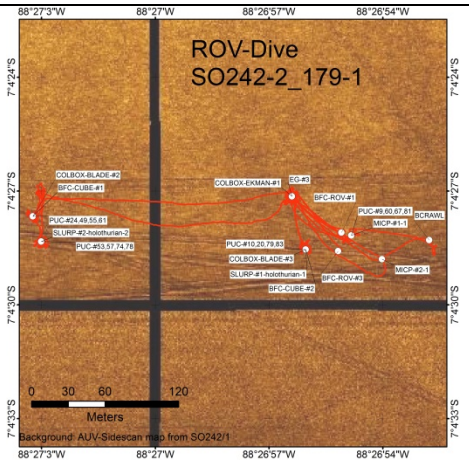
St. #	Date (UTC)	Map	Summary
169	07./08.09.2015		DEA East Plough Track Profiler 1 and Profiler 2 were carried down with ROV. Micro Profiler 1 and 2 were deployed in an undisturbed area and on a ripple crest inside the plough track, respectively. Both Profilers were repositioned within their microhabitat once during the dive. We collected 14 push cores from the ripple valley microhabitat and 2 push cores from a white patch in the old plough tracks. During the dive we observed the deployment of the Crawler, which was lowered from the ship via cable and released by the Launcher. Unfortunately, the Crawler did not start moving – we checked back on the Crawler 2 hours later after some push coring and relocating of the Profilers. A sediment plume experiment was conducted by whirling up sediment with the ROV and drifting in the sediment cloud for about 1 h. 3 Niskin bottles were fired at different times to sample the sediment particles and water in the plume. Finally, both Profilers and all three Chambers were picked up and fixed onto Elevator 1 for recovery. Chamber 3 and Beacon 68 were brought up by the ROV.
176	09.09.2015		DEA East Plough Track The major aim of this dive was to perform in situ flux measurements as well was push core and fauna sampling. The dive started with the placement of the ROV-Microprofiler MICP1-1 and ROV-Chamber BFC3 on a white spot of the plough track, right next to each other. After taking the second set off in situ tools from the elevator, both - Profiler MICP2-1 and chamber BFC1 – were placed on an undisturbed area. We collected three different nodules – nodule, nodule with sponge and worm and nodule with sponge - for incubation in the nodule incubator “Knolle”. We took 14 push cores from a white spot inside the plough track. We replaced both Profiler for a second deployment (MICP1-2 on undisturbed area and MICP2-2 on white patch) and for a third deployment (MICP2-3 on white spot and MICP1-3 on undisturbed area, just 1m next to last measurement). The last action during this dive was to collect a holothurian, crinoid, isopod, ophiroid and an unknown object with the slurp gun.
179	10./11.09.2015		DEA East Plough Track We repositioned profiler 2 over a white spot (Waypoint: Profiler 2 white spot D179). It had damaged electrodes. We then moved to photograph the crawler moving around at the seafloor. Profiler 1 was then repositioned in an undisturbed area next to the track (Waypont: Profiler 1 undisturbed D179). A total of 3 meiofauna push cores were taken in an undisturbed area and one X-ray core in the valley of the track. The CUBES were then sampled after 4 days of incubation, and placed on the elevator. All CUBE sampling (push cores and blade cores) were successful except we lost the holothurian from CUBE 1 and had to resample PC53. An Ekman grab was collected from right next to the elevator for background isotopes. MPI chambers 1 and 3 and profilers 1 and 2 were then picked up and the dive was finished.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

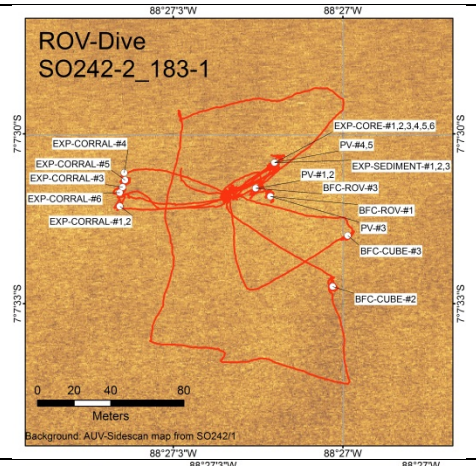
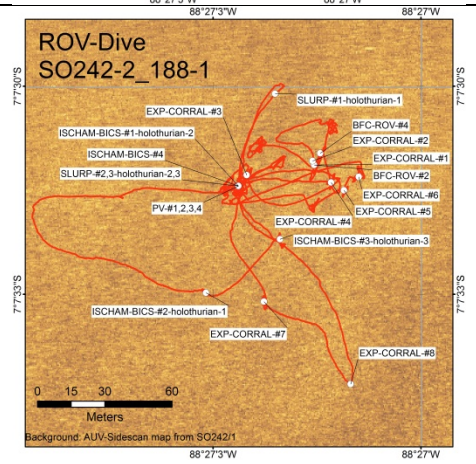
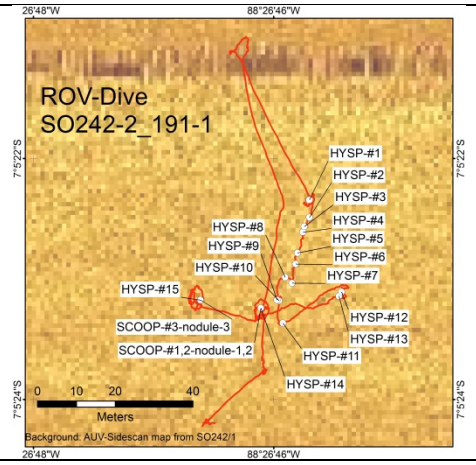
St. #	Date (UTC)	Map	Summary
183	11./12.09.2015		Southern Reference (outside DEA) During dive 183 two benthic chambers (BFC 3 and 1) were deployed next to and over a nodule, both deployments were recorded with the lower HD camera. The CUBE experiment (BFC 3) was successfully set up. The Meiofauna ecotoxicology experiment was also set up successfully except that EXP 6 (meiofauna corral 6) was replaced once. The sediment deposition experiment was set up successfully. During the dive waypoints for plastic trash were set to sample at later dives. No samples were taken during this dive.
188	12./13.09.2015		Southern Reference (outside DEA) During this dive we deployed benthic flux chambers on sediment with/without polymetallic nodule, completed the deployment of the sediment dispenser experiment, deployed the holothurian ecotoxicology experiment, and deployed the BICS respirometers. Benthic flux chamber 2 was placed on sediment with a nodule and benthic flux chamber 4 was placed on sediment without a nodule, adjacent to benthic flux chamber 2. Sediment dispensers were recovered without disturbing the experimental cores. 6 ecotox holothurian enclosure corrals were deployed over *Scotoplanes* sp. and treated with and without addition of artificial sediment and with copper-spiked artificial sediment. 2 ecotox holothurian enclosure corrals were deployed over *Benthodytes* sp. and treated with addition of artificial sediment and with addition of artificial sediment spiked with copper. 3 Holothuria were sampled with suction pump and delivered to the BICS respirometers chambers. 1 BICS chamber was used to determine background respiration.
191	13.09.2015		LBL-mooring/Hyperspectral camera The LBL-mooring was located within 20 minutes after reaching the seafloor. The release failure was determined to be caused by the buoyancy elements imploding. Since the cutting implements of the Rigmaster had been removed to accommodate the Hyperspectral Imager, the instruments could not be recovered on this dive. Both Transponder and MAPR seem to be intact after visual inspection, and a recovery dive will be planned towards the end of the cruise. The hyperspectral scanning was successful, although an unfortunate electrical interaction between the UHI and lower HD-camera led to the HD-camera malfunctioning. Three scanned nodules were successfully recovered.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

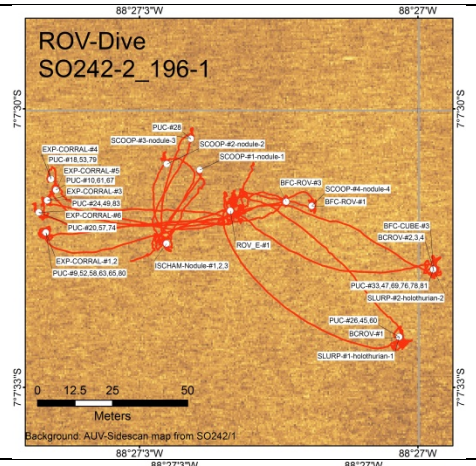
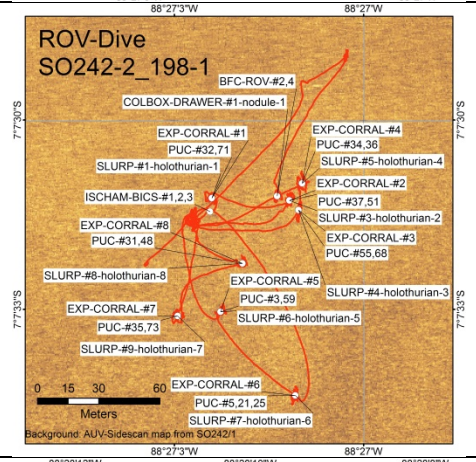
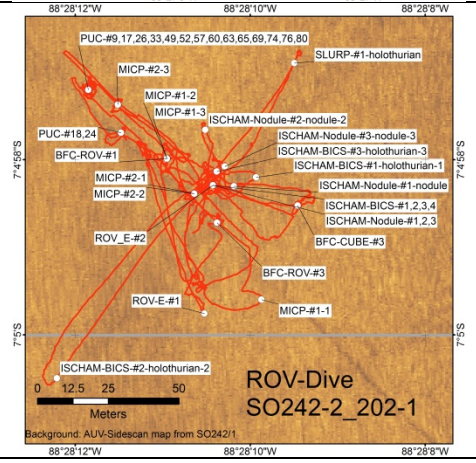
St. #	Date (UTC)	Map	Summary
196	15./16.09.2015		Southern Reference (outside DEA) During dive 196 we deployed three chambers for nodule incubation experiments. One nodule with a sponge (chamber 3), one nodule without sponge (chamber 2) and one nodule with part of a xenophyophore (chamber 1) were placed into the incubation chambers. In each CUBE (2 and 3), one holothurian, three push cores and one blade core were taken. One blade core next to CUBE 3 was taken as a reference. Algae deposition in CUBE 2 was clearly visible. Six meiofauna corrals were successfully picked up and three push cores taken in each corral. Lastly, chamber 1 and chamber 3, with and without nodule respectively, were collected.
198	16./17.09.2015		Southern Reference (outside DEA) This dive sampled experiments deployed on dive SO242/2_198 and sampled plastic litter. 1 *Scotoplanes* sp. was sampled from each of 6 ecotox holothurian enclosure corral treatments: 2 without addition of artificial sediment, 2 with addition of artificial sediment, and 2 with addition of artificial sediment spiked with copper. 1 *Benthodytes* sp. was sampled from each of 2 ecotox holothurian enclosure corral treatments: 1 with addition of artificial sediment, 1 with addition of artificial sediment spiked with copper. 2 push cores were sampled from each ecotox holothurian enclosure corral treatments. Plastic litter was sampled. Benthic flux chamber 2 and 4 were recovered, with a polymetallic nodule from benthic flux chamber 2.
202	17./18.09.2015		DEA Southwest EBS and Plough Track Three nodule respiration chambers were filled with nodules including epizoans. Two profilers (MICP) were replaced three times on different habitats. Two benthic flux (BFC-ROV) were placed in the track. 14 push cores were taken in the white scratches and 2 push cores from the side pile. Four BICs respiration chambers were used; one as a reference and three filled with the Holothurians *Synallactes* and *Paelopatides*.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

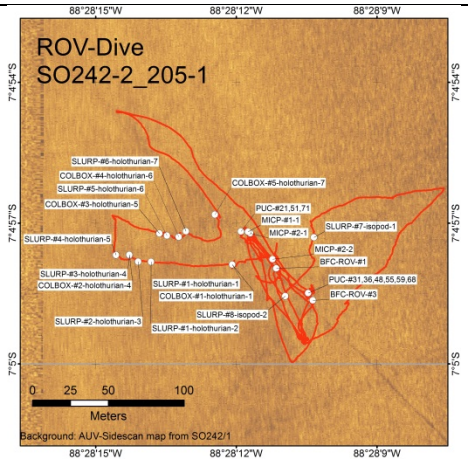
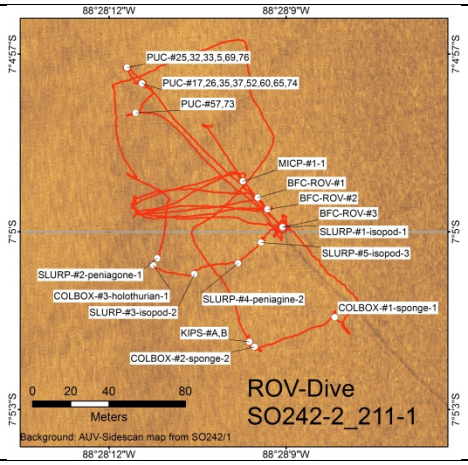
St. #	Date (UTC)	Map	Summary
205	18./19.09.2015		DEA Southwest EBS and Plough Track During dive 205 93 Photos (PV) where taken and video footage of undisturbed areas, old pl. tracks as well as reaching and leaving the see floor with the ROV was produced (PV37). The dive started with putting the profilers to a new spot. Profiler two was found fell over, it was placed at a spot with high inclination during dive D202. In general the profiler (MICP) and chamber (BFC) actions worked out well. Seven samples where slurped successfully into slurp containers (SLURP1-7), additionally five samples where put to the biobox using the slurp gun (COLBOX1-5). Highlights of the biological observations are the photos and films of a crab (PV41), a snail (PV43), and the occurrence of two rare sponges, one shaped cigar-like, hollow and thin walled (PV38) the other one cup-shaped and relatively giant (PV47). Sediment was sampled with push cores (PUC) where five cores where taken off white spots and four off brownish rim of track.
211	20./21.09.2015		DEA Southwest EBS and Plough Track During dive 211 profiler 1 was placed on a white patch in the EBS track. Afterwards, the three chambers were placed in the EBS track, aimed at white patches as well. Penetration depth was sufficient for all three chambers. Two push cores were taken next to the EBS track and 14 push cores at the rim of the EBS track. During the dive, various animals were sampled: two sponges were placed in the biobox and three isopods, two *Peniagones* and one holothurian were slurped into the slurp gun chambers. The KIPS was tested during this dive in order to see if it will work for the planned plume experiment. Unfortunately, only two bottles could be filled successfully. During closure of bottle B the signal was lost.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

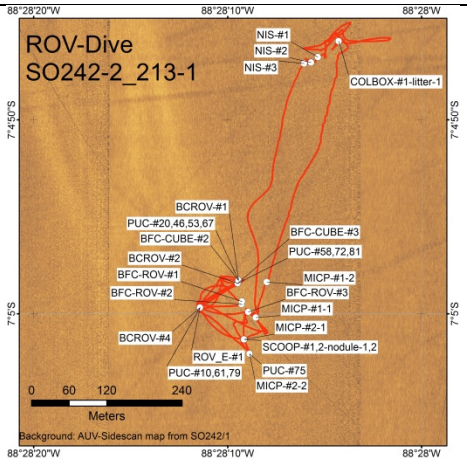
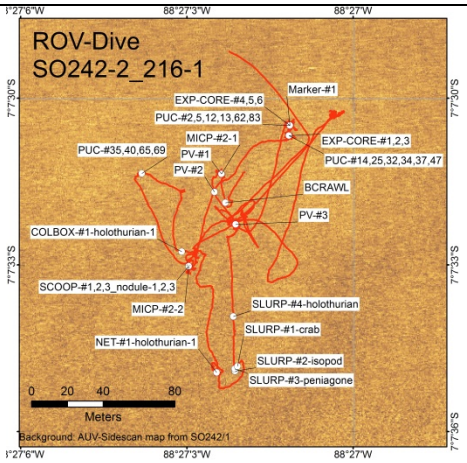
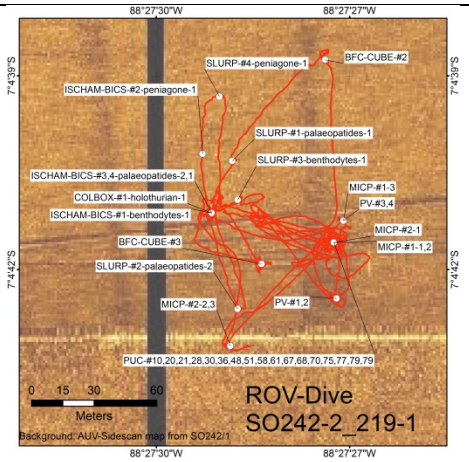
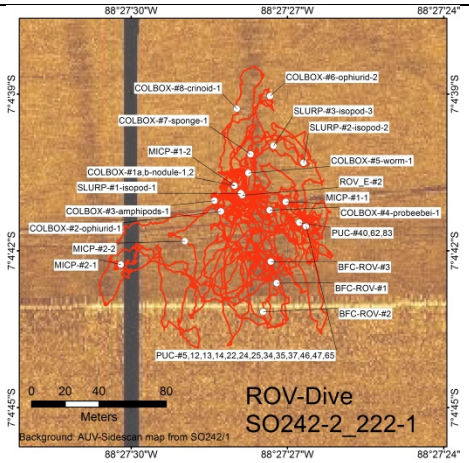
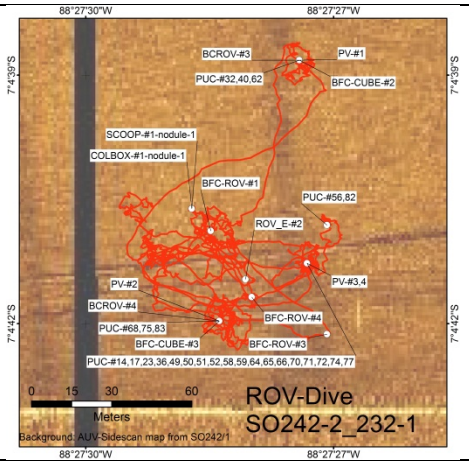
St. #	Date (UTC)	Map	Summary
213	21./22.09.2015		DEA Southwest EBS and Plough Track During dive 213 we started with placing Profiler 2, which was carried down by the ROV, in the undisturbed seafloor area outside the EBS track and old plough marks. However, after removal of the nodules the seafloor was too unstable and Profiler 2 fell breaking several sensors, instead only background profiles were measured. Profiler 1, which was already deployed during the previous Dive 211, was relocated inside the EBS track. Both profilers were relocated once during this dive, but within the same microhabitat. A third sediment plume experiment was conducted at the other EBS track in this part of the DEA – about 450 m further northeast, drifting for about 1h in the produced cloud. Unfortunately, the ROV could not be kept central in the cloud all the time. Since the KIPS system did not work, 3 Niskin bottles were fired at different times and, additionally, 2 MAPR (measuring turbidity) and 3 oxygen sensors were installed for this experiment. A plastic garbage bag with a rusting coke can, was picked up right before starting the plume experiment. The second half of the dive was dedicated to sediment coring (using push and blade corers) below CUBE 2 and 3 and a reference site. In between the isopod and amphipod traps, attached to Elevator 1 were inspected. Finally, the Cubes were stored on Elevator 2, while Profiler 1, 3 Chambers (from Dive 211), and 3 Blade corers were stored on Elevator 1. Both Elevators were brought up after the ROV dive. Profiler 2 was recovered by the ROV.
216	22./23.09.2015		Southern Reference (outside DEA) Dive 216 started with the observation of the Crawler on the bottom. It seemed to have crawled as planned, but later this dive it was found out that the profiler did not work and, additionally, the release malfunctioned and the Crawler was brought back by means of a wire from the ship that was attached to the Crawler by the ROV. One micro profiler was deployed on a spot under a nodule after removal of the nodule. It was re-deployed later that dive, again on a spot under a nodule. The sampling of the Sediment deposition experiment with two push cores per experimental core went as planned and without problems. Background push core samples close to the Meiofauna corral site were taken. During dive 216 one salp, four holothurians, one crab with anemone, one isopod and a piece of trash were collected. The holothurian of the handnet sampling was lost during ascent.

Table 7.4.2 continued. *Dive summaries from SO242/2.*

St. #	Date (UTC)	Map	Summary
219	23./24.09.2015		DEA Central Plough Track This dive began by the deployment of the two MPI profilers on white ripples, before both profilers were re-positioned two times during the dive. Also the two MPI chambers were deployed, before 14 pushcores were sampled at white patches and on the sediment hill. Two more pushcores were taken in a valley directly next to a white patch. Cube 2 and 3 were placed over one *Scotoplanes* specimen each and the cube program was started. The BICS chambers were filled with two *Palaeopatides* sp., one *Benthothuria* and one *Peniagone* sp. Additionally, one *Benthodytes* specimen was transferred into the Senckenberg biobox after it was damaged while trying to suck it for transport to the BICS chamber and one unknown holothurian species was caught with the handnet and transferred to the Senckenberg biobox.
222	24./25.09.2015		DEA Central Plough Track During dive 222 a benthic chamber that was brought down on the porch of the ROV was deployed on a crest in the track. Two more benthic chambers that were deployed during the previous dive (SO242/2_219) on the disturbance track (microenvironments white spot and valley) were collected at the end of the dive. Two micro profilers were each repositioned twice (profiler 1: valley, undisturbed off track on patch with freshly removed nodules; profiler 2: white spot, white spot between ripples) and collected in the end. A total of 16 push cores were taken in the disturbance track, 3 on white patch and 13 in a valley. A total of 11 fauna samples (ophiuroid, crinoid, isopods, amphipods, sponge, parapagurid crab with anemone, unidentified worm) were obtained using the slurp gun and the ROV's manipulator and transported up in the Senckenberg biobox (8 samples) and the slurp gun containers (3 samples). In the beginning of the dive the ROV had technical problems that required a restart of the system. Posidonia positioning quality was poorer than in previous dives.
232	27.09.2015		DEA Central Plough Track Dive 232 was the last scientific dive of this cruise and was used to collect remaining instruments from the seafloor and to take the last set of pushcores. First, the MPI chamber 1 and 4 were deployed and recovered later in the dive (Chamber 1 on nodule, Chamber 4 on ripple). The Profiler already started due to time out with profiling on the elevator so all sensors were broken and therefore the profiler wasn't deployed. Then CUBE2 and CUBE3 were recovered by slurping holothurians and sampling with pushcores and bladecorers. A set of pushcores was taken on the ripple crest and in ripple valleys.

7.5 MUC Multicorer

L Lins, J Baeger

Gear description

The Multiple Corer (Multicorer, MUC) is a gear designed for sampling both meiofauna and sediment samples The Multicorer used in this cruise is equipped with 12 transparent acryl-glass-cylinders (tubes), each 62 cm in length, providing up to 12 parallel, undisturbed sediment samples per deployment. Each tube has an outer diameter of 99 mm, and an inner diameter of 94 mm. Therefore, the surface of the sediment sample taken with one tube covers an inner area of 69.4 cm^2. During this expedition, 5 deployments covering the Eastern, Western and Southern Reference areas took place. Figure 7.5.1 shows the MUC after sampling. The locations of all deployments are given in the Station List.

Deployment procedure

The MUC was deployed from starboard. The regular deployment started with lowering at 0.3-0.5 m/sec the first 100 m of cable. The MAPR and the Posidonia sensors were fixed on the cable at 50 m over the MUC. After fixing, lowering was continued with 0.7-1.0 m/sec to app. 50 m above the seafloor, where the winch stopped and the MUC remained standing during 1-2 min. Then, the MUC was lowered with 0.3 m/sec until landing on the bottom. After the MUC touched the bottom, 10 m of cable was released. The MUC stayed for 1-3 minutes at the bottom. Heaving normally started with 0.5m/sec, and after the gear was around 50 m from the bottom heaving was continued with 1.0 m/sec until 100 m under the surface. The last 100 m were continued with 0.3-0.5 m/sec.

Figure 7.5.1. *Multicorer (MUC) after being retrieved.*

Sampling/subsampling

Samples were divided between two research groups (see Table 7.5.1). For meiofauna, 4 cores were sliced per deployment (0-5 cm) and stored in formol 4%, one core was designated for abiotic factor measurements, including pigments (stored at -80°C) and total organic carbon and total organic matter (stored at -20°C), and one core was frozen (0-5 cm) for later DNA analyses. For microbiology 6 cores in total were sampled per deployment and sliced in five different layers (0-1 cm, 1-2 cm, 2-3 cm, 3-5 cm and 14-16 cm) resulting in 15 samples for each method. Slices from two cores were then pooled in order to have three replicates (A, B and C).

The following samples were taken for microbiology:
Analyses in the lab:

- AODC and FISH (2mL) stored at 4°C (AODC) and -20°C (FISH)
- DNA/ARISA (10mL) stored at -20°C
- RNA (10mL) stored at -80°C
- Chlorophyll a (3,5mL) stored at -20°C
- Phospholipids (5-30mL) stored at -20°C
- Porosity (3-4mL) stored at 4°C
- TOC (1mL) stored at -20°C
- Isotopes (25mL)
-

Analyses on board:

- EEA (*Extracellular enzymatic activity)* (25 mL+ 25 mL sterile filtered seawater)

Table 7.5.1. *Multicorer sample distribution*

Station	Analysis	Research group	Number of corers
147	Meiofauna	Senckenberg/ UGent (See section 7.11)	6
	Microbiology	MPI (See section 7.9)	1
148	Meiofauna	Senckenberg/ UGent (See section 7.11)	6
	Microbiology	MPI (See section 7.9)	2 (+2)*
151	Meiofauna	Senckenberg/ UGent (See section 7.11)	6
	Microbiology	MPI (See section 7.9)	1 (+3)*
194	Microbiology	MPI (See section 7.9)	6 (+6)*
208	Microbiology	MPI (See section 7.9)	6 (+5)*
229	Microbiology	MPI (See section 7.9)	6 (+2)*
	Porewater	Jacobs University (See section 7.7)	1

**The first number is the amount of cores for the main sampling and the number in brackets is the amount of cores for extra sampling.*

7.6 Ocean Floor Observation System (OFOS)

H Biebow, Y Marcon, A Purser

7.6.1 Gear description

The “AWI Launcher” OFOS is a towed underwater camera system equipped with both a high-resolution photo-camera (iSiTEC, CANON EOS 5D Mark III) and a high-definition video-camera (iSiTEC, Sony FCB-H11) (fig.7.6.1). The cameras are mounted on a steel frame (140L x 92W x 135H cm), together with two strobe lights (iSiTEC UW-Blitz 250, TTL driven), three laser pointers at a distance of 50 cm from each other that were used to estimate the size of seafloor structures, four LED lights, a Tritech Altimeter, and a USBL positioning system (Posidonia) to track the position of the OFOS during deployments.

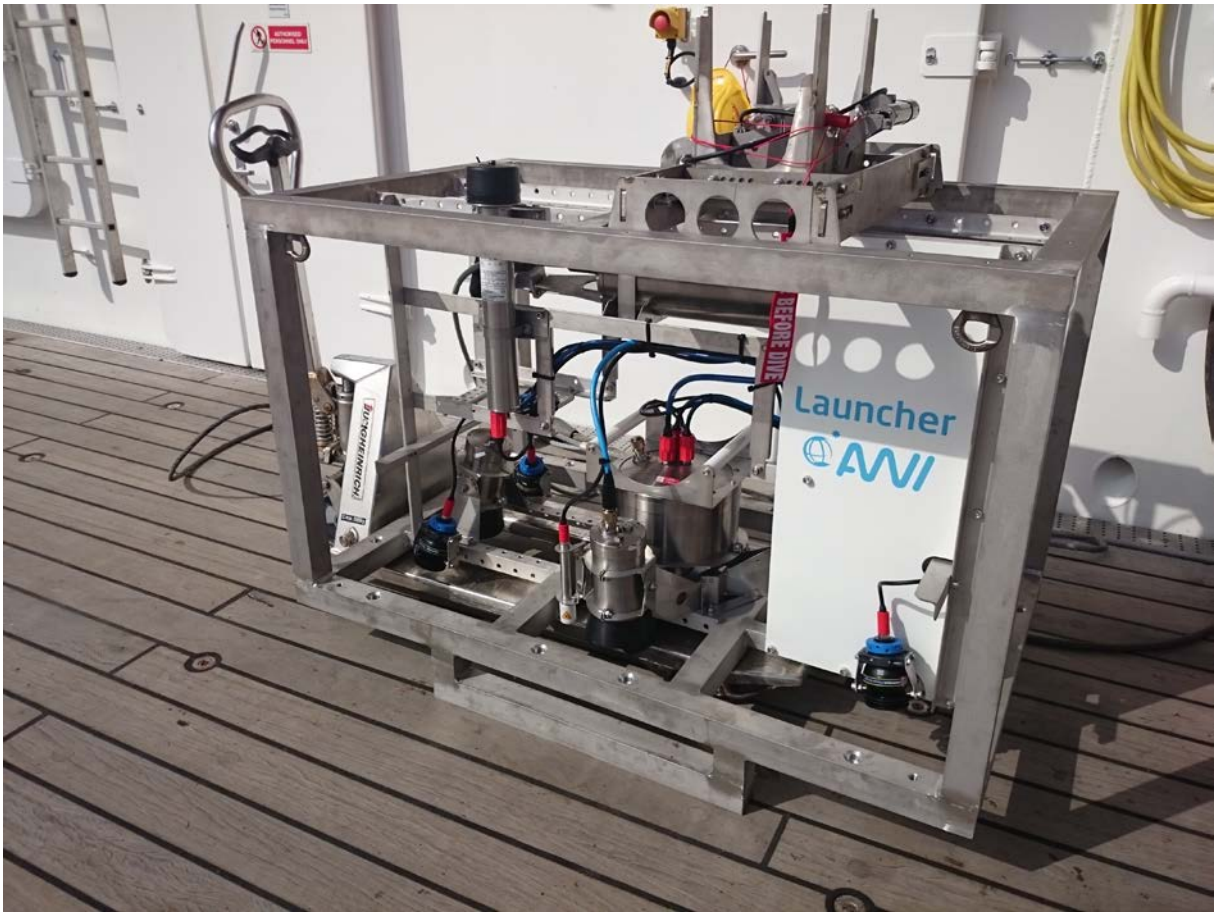


Figure 7.6.1. *The Ocean Floor Observation System (AWI Launcher). (Photo: Yann Marcon).*

7.6.2 OFOS survey tracks

In total, 21 OFOS deployments were carried out during the cruise (Table 7.6.1). Deployments were mostly focused within and around the DISCOL Experimental Area (DEA), where disturbance experiments had been carried out during previous work in the area (Fig. 7.6.2). The selection of the tracks was done in such a way as to survey areas of the seafloor with different levels of disturbance according to the classification proposed by Bluhm et al. (1995): disturbed areas (plough marks within the DEA), undisturbed areas (areas outside the plough marks but within the DEA) and the

reference areas (outside the DEA). However, we created one additional category to define the areas of the DEA that were recently disturbed with the Epi-Benthic Sledge (EBS) during cruise SO242/1.

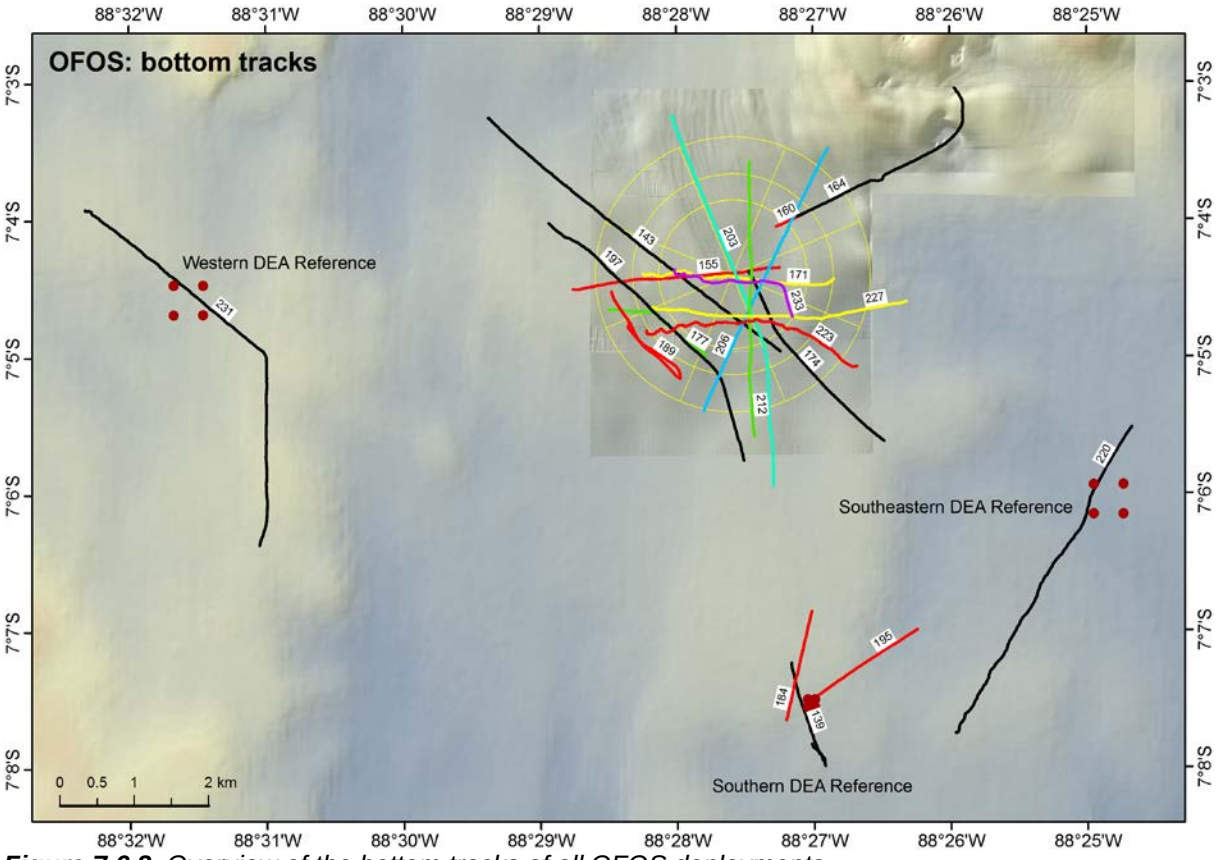


Figure 7.6.2. *Overview of the bottom tracks of all OFOS deployments.*

Surveying the disturbed areas was done by following the plough and EBS marks on the seafloor with the OFOS. Such operation was complicated by the narrowness of the tracks (<12m). To facilitate the work, we used the sidescan sonar maps resulting from cruise SO242/1 to identify the approximate location as well as the direction of the plough and EBS marks on the seafloor. Variable offsets of up to 40m were observed between the sidescan maps and the actual location of the marks, and constant communication with the nautical officers was required to steer the ship in order to maintain the OFOS above the disturbed areas.

All dives were conducted at an altitude of 1.5m above seafloor, except for one dive (station 233), which was conducted at a higher altitude (3.5m). The reason for this is to facilitate the comparison of the different imaging systems that have been used to study the benthic fauna in the area. Most of the previous survey images were taken with camera systems at altitudes between 3 and 4.5 m).

The last dive (station 236) was dedicated to the recovery of the LBL mooring that could not be recovered during cruise SO242/1. For this dive, a hook was attached with a 4.5m rope onto to the OFOS frame. The dive was successful at finding and recovering the LBL mooring.

In total, we collected 18,028 images: 15,442 ‘timer’ images for the quantification and analysis of the faunal density and community composition in the different areas, and 1,174 additional ‘hotkey’ images of features of interest that were observed during the dives. The ‘timer’ images include 1,740 images of plough marks, 350 images of EBS marks, 1,065 images of transition areas (between ploughed and undisturbed areas), 6,524 images of undisturbed areas, and 5,763 images of reference areas (Fig. 7.6.3).

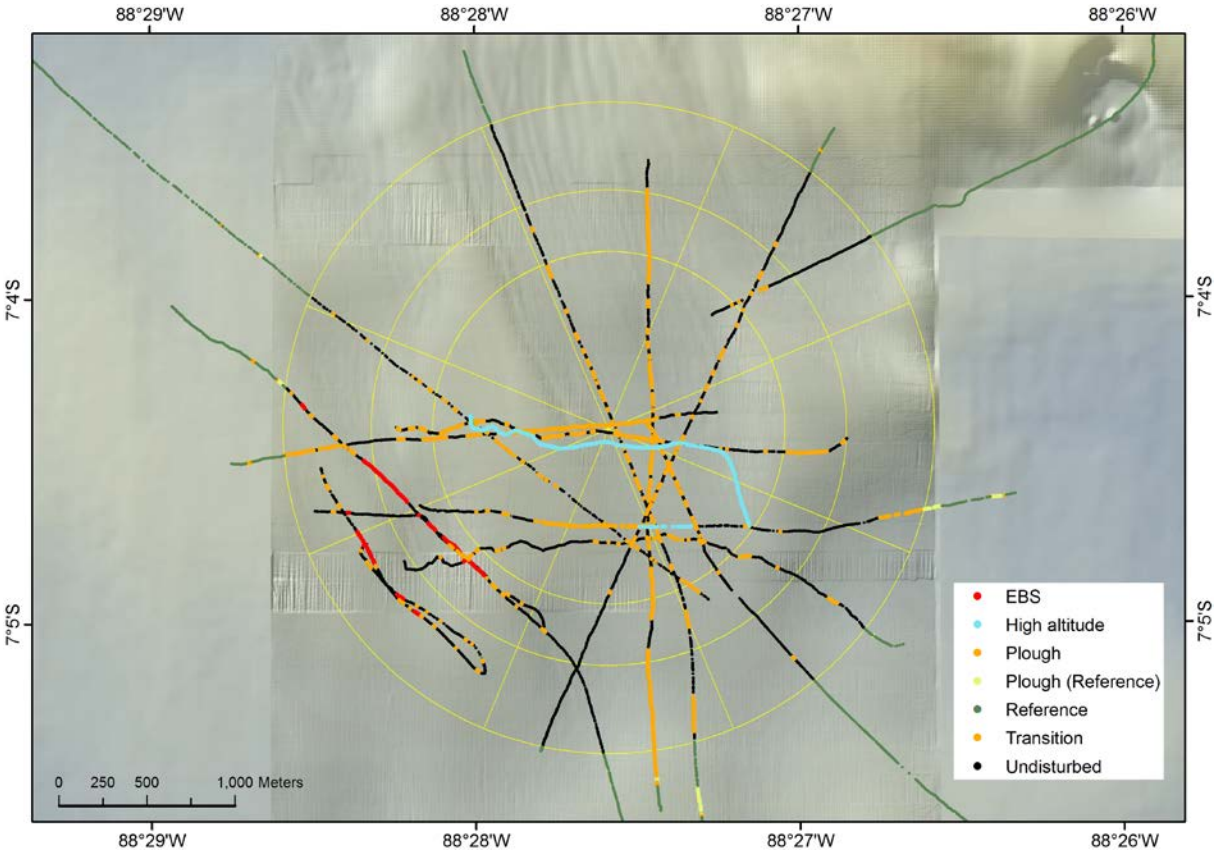


Figure 7.6.3*. Overview of the location of the different type of images acquired within the DEA (yellow circle).*

Table 7.6.1. List of OFOS deployments during cruise SO242/2

Station Number SO242/2	Date (UTC)	Time Start (UTC)	At Bottom (UTC)	Off Bottom (UTC)	Time End (UTC)	Location	OFOS Bottom Time
139	31.8.15	02:15	03:33	05:35	07:08	DEA Reference South	02:02
143	31.8./01.9.15	23:30	00:47	04:03	05:32	DEA crossing (NW-SE)	03:16
155	04.09.15	03:10	04:27	09:15	10:37	Disturbed area (plough)	04:48
160	04./05.09.15	22:43	00:00	01:02	02:09	Low backscatter area	01:02
164	06.09.15	00:04	01:11	06:49	08:09	Low backscatter area and volcano	05:38
171	08.09.15	04:51	06:09	11:52	13:13	Disturbed area (plough)	05:43
174	09.09.15	07:47	02:44	07:00	08:32	Low backscatter area and LBL mooring search	04:16
177	10.09.15	01:31	02:49	07:00	08:19	Disturbed area (EBS)	04:11
184	12.09.15	02:38	03:54	06:16	7:43	DEA Reference South	02:22
189	13.09.15	01:35	02:54	08:11	09:32	Disturbed area (EBS)	05:17
195	15.09.15	07:52	09:06	11:52	13:13	DEA Reference South	02:46
197	16.09.15	03:17	04:36	11:54	13:15	Disturbed area (EBS)	07:11
203	18.09.15	02:12	03:27	11:27	12:47	DEA crossing (NW-S)	08:00
206	19.09.15	04:09	05:25	11:30	12:53	DEA crossing (SW-NE)	06:05
212	20./21.09.15	23:58	01:16	08:27	10:13	Disturbed area (plough)	07:11
220	24.09.15	04:03	05:23	11:00	12:19	DEA Reference SE	05:37
223	25.09.15	03:58	05:18	10:00	11:20	Disturbed area (plough)	04:42
227	26.09.15	03:55	05:18	10:00	11:24	Disturbed area (plough)	04:42
231	27.09.15	01:21	02:40	11:10	12:29	DEA Reference West	08:30
233	28.09.15	07:15	08:39	11:35	12:53	High-altitude (3.5m) survey	02:56
236	29.09.15	06:01	07:20	8:56	10:13	LBL mooring recovery	01:46

7.6.3 Results & Fauna

The fauna wound within the DEA and the surrounding area appears to be very diverse, and biomass surprisingly high. Distribution of various taxa and species throughout the survey region seems to be largely driven by nodule availability – i.e. the presence or absence of hard substrate on which to settle. The main seafloor types categorized from the image data thus far are illustrated in figure 7.6.4.

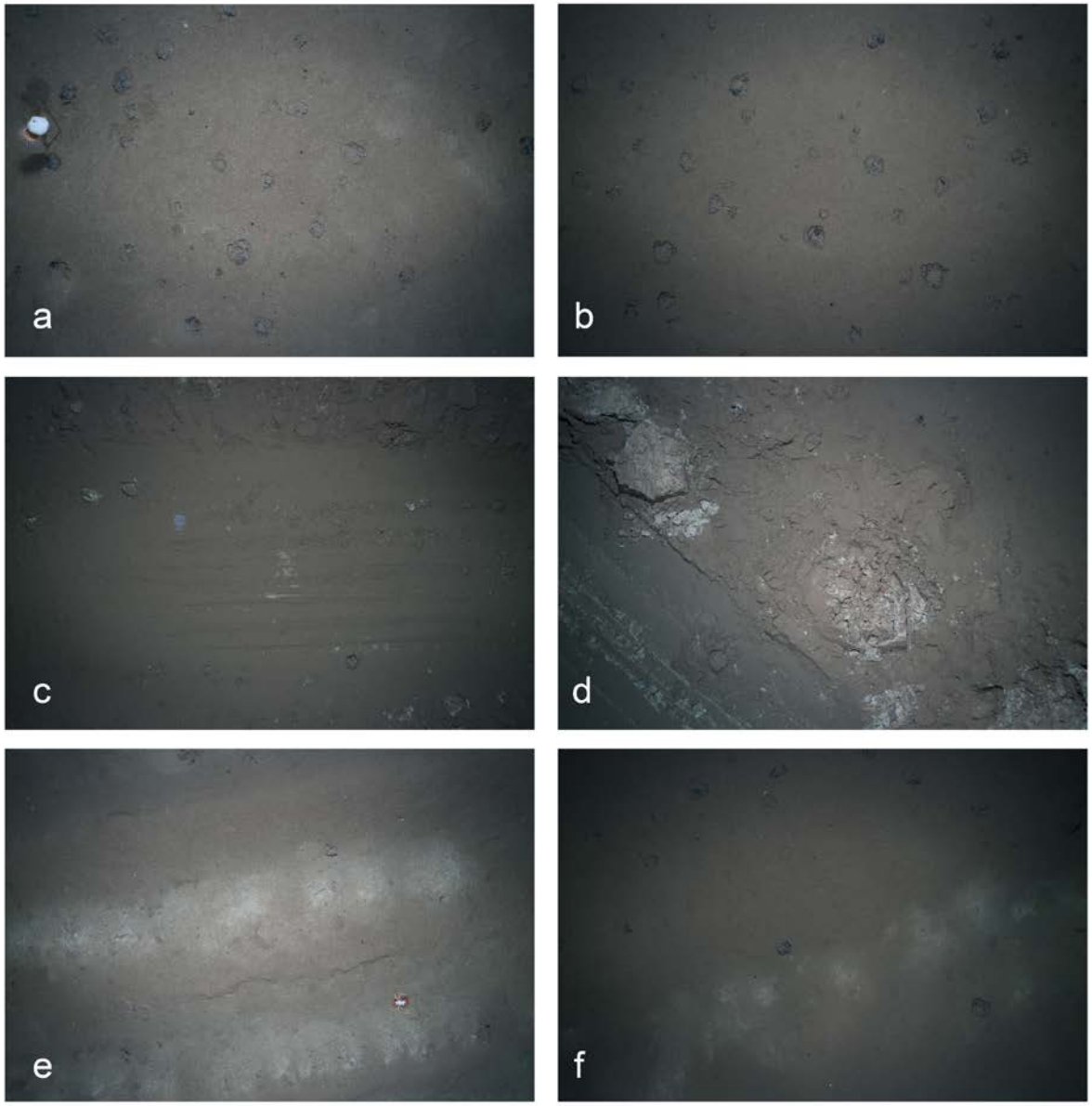


Figure 7.6.4. *Main seafloor categories observed during SO242/2.* ***a)*** *Undisturbed seafloor within the DEA* ***b)*** *Reference area habitat outside the DEA* ***c)*** *EBS sled track – mid track* ***d)*** *EBS sled track – piled sediments on margin of track* ***e)*** *Typical, moderately deep ploughmarks within the DEA* ***f)*** *Transient zone image, showing areas of both ploughed sediment and the surrounding seafloor.*

As can be seen in figure 7.6.4, in areas ploughed (or subjected to EBS action) the nodule abundance falls to near zero. Even the nodules still present on the surface after disturbance have been moved, likely upended and partially sediment covered. Our analysis of the images to date show a near absence of the larger sessile fauna requiring hard substrates from all EBS and ploughed regions. Mobile organisms, such as the crab in figure 7.6.4e, are still observed in what appears equal density within and outside of the plough tracks.

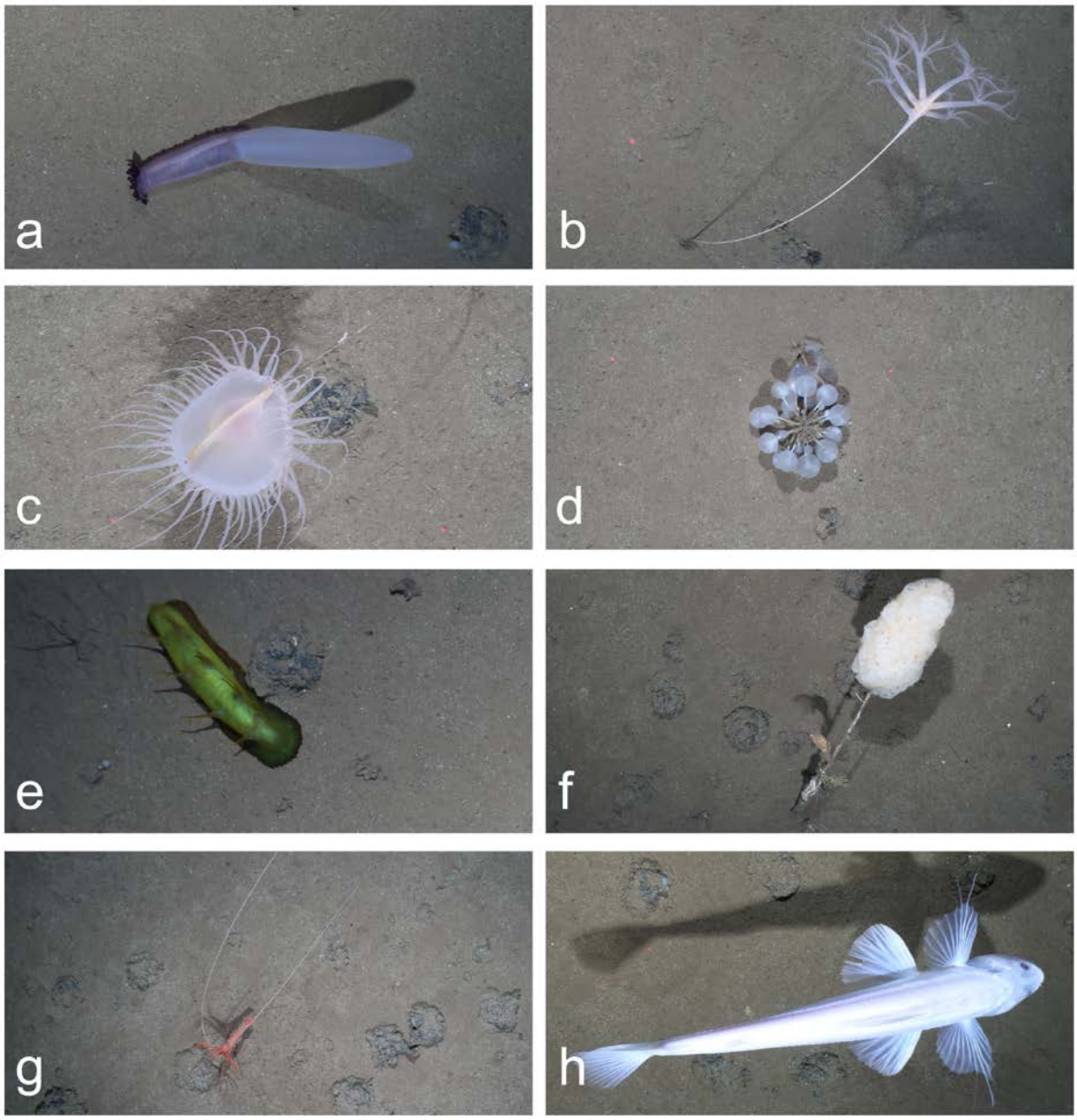


Figure 7.6.5. *Selection of fauna from the DISCOL area.* ***a)*** *A large (40 cm holothurian) observed in a sedimented area adjacent to a trawl track* ***b)*** *A pennatulid of undetermined species, these were observed in the reference area of the DISCOL area, and occasionally within undisturbed areas of the DEA* ***c)*** *Anenomes commonly attached to nodules across the region, with a lesser number observed on soft sediments* ***d)*** *An example of the many diverse glass sponges found predominantly on nodules* ***e)*** *another holothurian, undetermined species, found in both undisturbed and disturbed areas* ***f)*** *a stalked sponge, with colonization of the sponge itself by filter feeders, a barnacle, coral and several ophiroids on the stalk* ***g)*** *One of the larger shrimp found in the area* ***h)*** *Fish observed several times during most OFOS dives, a diverse set of species logged.*

As recorded by SO242/1 and other, earlier DISCOL research cruises, biogenic stalk structures, be they stalked sponge derived or crinoid derived, provide a habitat niche for various species. Brisingids were often observed on dead stalks, alongside barnacles, polychaete worms, numerous and diverse isopod species, ophiroids, anenomes, corals, cephalopods, amphipods and sponges. In analysed images, very few stalks were observed in the ploughed areas and none in the EBS tracked areas.

Various relationships were observed between species. A close association between a crab and anemone species was recorded (samples collected for identification), and several isopod species were observed almost exclusively with particular types of sponge. Possible territorial behavior was also observed, with a pairing of two amphipods (as yet unidentified species) often seen on dead stalks, free of all other colonist individuals.

From the brief analysis of the images collected thus far, it appears likely that megafauna community structures within the ploughed areas of the DISCOL DEA have not reverted to those observed prior to ploughing, despite the 26 years since the active disturbance of the seafloor.

7.7 Geochemical Analyses

S Bohsung, A Bleyer, M Haeckel, K Hamann, F Janssen, S Paul

7.7.1 Introduction

The geochemical analyses of the porewaters and sediments of the DISCOL area in the Peru Basin aim at quantifying the biogeochemical fluxes and turnover rates associated with organic carbon mineralization and polymetallic nodule formation. The goal is to identify and assess the impact of the disturbance and recolonization experiment set in 1989 by ploughing the seafloor.

Complementing the work of Leg 1 (see Cruise Report SO242/1), during Leg 2 surface sediments were cored via ROV-deployed pushcores (PUC) – only one multi-corer deployment (MUC) was necessary due to unfavourable weather conditions. The ROV operations allow for precise positioning of cores and thus the primary aim was to sample microhabitats as identified by visual inspection during the ROV dives (see Chapter 7.4). These microhabitats included: white sediment patches, ripple valleys and crests inside as well as a site 10-20 m outside of the plough marks, the latter presumably being of undisturbed character. Overall, this sampling strategy was accomplished at 3 different locations in the DEA (west, east, south) and in a similar fashion also for a track created by the epi-benthic sledge (EBS) during Leg 1 (Fig. 7.7.1). The latter allows attaining a geochemical dataset directly after a disturbance, which does not exist for the plough experiment from 1989. A comprehensive geochemical dataset complementary to that from Leg 1 will be collected by onboard and onshore analyses.

Onboard, the collected porewater samples were analysed for their content of dissolved O_2, NO_3^-, NO_2^-, NH_4^+, PO_4^{3-}, SiO_4^{4-}, Fe^{2+}, and total alkalinity (GEOMAR). GEOMAR also took sub-samples for further shore-based analyses of the DIC content and its $\delta^{13}C$ signature, dissolved metal cations, SO_4^{2-}, Br^-, Cl^-, and I^- concentrations, isotopic ratios of Sr, Li, H, and O in the porewater as well as porosity, carbonate, POC, PON, and total sulfur content. JUB collected porewater subsamples for DOC, Mn(II/III) speciation, trace metal – including REY – analyses, and metal ligands in their home laboratory as well as samples for amino acids and N-isotope analyses to be carried out at the University of Hamburg.

See Table 7.7.2 for a complete list of sub-samples and variables. A photo documentation of the retrieved PCs and the MUC can be found in Appendix 11.D.

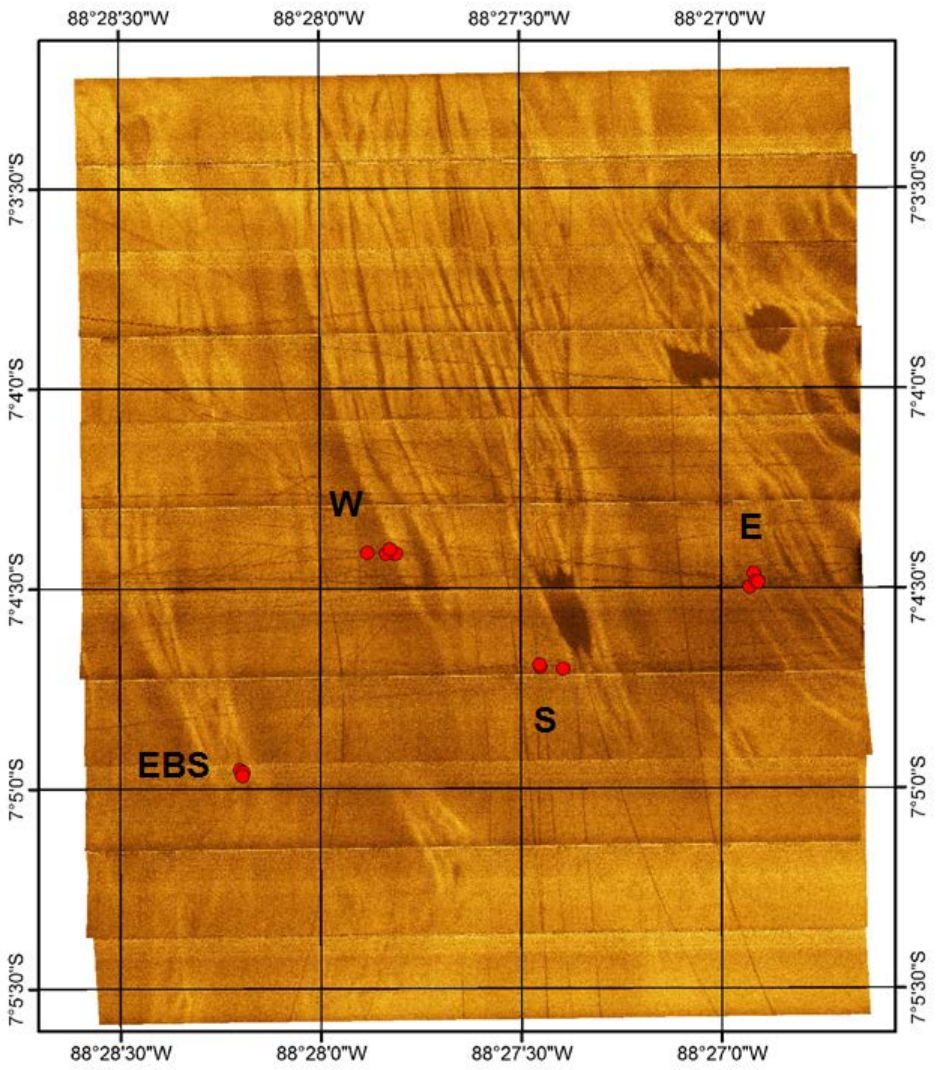


Figure 7.7.1. *Map of the sidescan sonar image of the DEA showing the plough mark and EBS study sites. For precise coordinates see Table 7.7.2.*

7.7.2 Sediment and porewater sampling

Surface sediment samples were retrieved using push cores operated by the ROV (see Chapter 7.5), except for one core outside the southern plough mark site that was sampled by multi-corer (see Tab. 7.7.2). After core retrieval, the PUC (and MUC) cores were directly brought into the ship's cold room (~4 °C), where the sediment was extruded out of the plastic liners with a piston and cut into 1-2 cm thick slices under oxygen-free, argon atmosphere in a glove bag. Subsequently, the porewater was extracted out of the sediment in the glove bag using a low pressure-squeezer (argon at 3-5 bar). While squeezing, the porewater was filtered through 0.2 µm regenerated cellulose Whatman filters and collected in recipient vessels.

About 5 ml of wet sediment of each sediment slice was collected for porosity, carbonate and CNS element analyses at home. Aliquots of the extracted porewater were sub-sampled for various onboard and further shore-based analyses (Table 7.7.2). Subsamples for ICP-AES analysis were acidified with 30 µl of concentrated suprapure HNO_3 per 3 ml of porewater sample (i.e. pH<1) and ~1.9-ml subsamples for DIC and its $\delta^{13}C$ were treated with 10 µl of $HgCl_2$ to inhibit further microbial degradation. All samples for home-based analyses were stored refrigerated.

For porewater extraction using a centrifuge (JUB), PUC sediment slices of 2 cm thickness were transferred into 50 mL acid-cleaned centrifuge tubes in the glovebag under an argon atmosphere and centrifuged for 40 min at 3,200 rpm. After centrifugation, the porewater was filtered through a 0.2 µm acid-cleaned cellulose acetate filter, again in a glove bag under a steady stream of argon gas. Subsamples for DOC, Mn(II/III) speciation, and trace metal – including REY – analyses were taken. Two PUCs were also sampled for amino acid and N-isotope analyses and another three PUCs for ligand analyses using rhizon samplers with an average pore size of 0.1 µm. Mn(II/III) speciation, ligand as well as amino acid and N-isotope samples were stored at -20 °C, whereas samples for DOC and trace metal analyses were acidified to pH 2 with HCl and kept refrigerated. Centrifuged sediment was stored refrigerated for home-based analyses of the solid phase trace metal and REY content. This will be done by pressure digestion and subsequent analyses with ICP-OES and ICP-MS.

In total, sediment samples from 16 ROV-operated PUCs and 1 MUC were collected for porewater and sediment analysis (Table 7.7.2).

In addition, whole cores were sampled for x-ray analyses in the home lab by means of ROV push cores and Multiple Corer (Table 7.7.3). To minimize transport artefacts, the overlying water has been replaced by hydrophilic foam material. The sampling during SO242/2 adds to a set of four cores obtained with the Multicorer during the previous leg. Whole core x-ray analyses have already been performed in an earlier post impact study in the DEA (Schriever and Thiel 1992) in order to determine the thickness of the layer of fines that settled from the sediment plume created by the plough. For the current study it is planned to additionally target bioturbation intensity. X-ray investigations will be performed in collaboration with Dr. Hendrik Lantzsch (MARUM, Bremen, DE). It is planned to integrate the findings with quantifications of bioturbation obtained by Dr. Henko de Stigter (NIOZ, Texel, NL) by means of radiotracer analyses. Table 7.7.2 lists the cores and the habitats where they have been taken.

7.7.3 Porewater analyses

Analyses for the porewater solutes NO_3^-, NO_2^-, NH_4^+, PO_4^{3-}, SiO_4^{4-}, and Fe^{2+} were completed onboard using a Hitachi UV/VIS spectrophotometer. The respective chemical analytics followed standard procedures (Grasshoff et al., 1999), i.e. nitrite and nitrate (after reduction with Cd) were measured as sulphanile-naphthylamide, ammonium was measured as indophenol blue, phosphate and silicate as molybdenum blue, and iron with ferrospectral.

The total alkalinity of the porewater was determined by titration with 0.02 N HCl using a mixture of methyl red and methylene blue as indicator. The titration vessel was bubbled with argon to strip any CO_2 produced during the titration. The IAPSO seawater standard was used for calibration.

The analytical precision and accuracy of each method are given in Table 7.7.1.

Table 7.7.1. *Analytical methods of onboard geochemical analyses.*

Parameter	Method	Detection limit	Analytical precision	Analytical Accuracy
Fe^{2+}	Photometer	1 µmol/l	3 %	-
NO_3^-, NO_2^-	Photometer	0.5 µmol/l	3 %	-
NH_4^+	Photometer	1 µmol/l	5 %	-
PO_4^{3-}	Photometer	1 µmol/l	5 %	-
SiO_4^{4-}	Photometer	5 µmol/l	2 %	-
Alkalinity	Titration	0.05 meq/l	3 %	4 %

Table 7.7.2. *List of sampled cores and collected sub-samples.*

Station Device	**Area**	**Lat (S)**	**Lon (W)**	**Water depth / m**	**PW**	**Poros / CNS**	**IC**	**ICP-AES / 87/86 Sr**	**DIC / $\delta^{13}C_{DIC}$**	**Iso PW**	**DOC**	**Mn / trace metal**	**AA / N-iso**	**Ligands**	**Core length / cm** GEOMAR / JUB	**No. samples** GEOMAR / JUB
142 ROV PUC 33/23	DEA W ripple crest	7°04.4094'	88°27.8330'	4139	X	X	X	X	X	X	X	X	-	-	22 / 23	13 / 12
142 ROV PUC 48/47	DEA W white patch	7°04.4113'	88°27.8127'	4140	X	X	X	X	X	X	X	X	-	-	14 / 17	9 / 9
146 ROV PUC 77/58+28	DEA W ripple valley	7°04.4110'	88°27.8363'	4139	X	X	X	X	X	X	X	X	-	X	16 / 17 (17 Ligands)	10 / 9 (3 Ligands)
146 ROV PUC 79/76	DEA W outside track	7°04.4000'	88°27.8266'	4140	X	X	X	X	X	X	X	X	-	-	18 / 19	11 / 10
163 ROV PUC 83/38	DEA E ripple crest	7°04.4926'	88°26.9333'	4143	X	X	X	X	X	X	X	X	-	-	18 / 22	11 / 11

Table 7.7.2 continued. *List of sampled cores and collected sub-samples.*

Station Device	**Area**	**Lat (S)**	**Lon (W)**	**Water depth / m**	**PW**	**Poros / CNS**	**IC**	**ICP-AES / 87/86 Sr**	**DIC / $\delta^{13}C_{DIC}$**	**Iso PW**	**DOC**	**Mn / trace metal**	**AA / N-iso**	**Ligands**	**Core length / cm** GEOMAR / JUB	**No. samples** GEOMAR / JUB
166 ROV PUC 70/64+28	DEA E outside track	7°04.4585'	88°26.9240'	4143	X	X	X	X	X	X	X	X	X	-	16 / 20 (21 AA)	11 / 11 (5 AA)
166 ROV PUC 69/63	DEA E ripple valley	7°04.4780'	88°26.9178'	4143	X	X	X	X	X	X	X	X	-	-	22 / 20	12 / 10
169 ROV PUC 83/10	DEA E white patch	7°04.4808'	88°26.9130'	4144	X	X	X	X	X	X	X	X	-	-	11 / 22	8 / 11
196 ROV PUC 28	Reference South	7°07.5041‘	88°27.0406‘	4156	-	-	-	-	-	-	-	-	-	X	- / 20	- / 3
202 ROV PUC 80/63	DEA W EBS inside track	7°04.9533'	88°28.1980'	4150	X	X	X	X	X	X	X	X	-	-	20 / 22	12 / 11
202 ROV PUC 18/24	DEA W EBS side pile	7°04.9609'	88°28.1907'	4150	X	X	X	X	X	X	X	X	-	-	16 / 15	10 / 8

Table 7.7.2 continued. *List of sampled cores and collected sub-samples.*

Station Device	**Area**	**Lat (S)**	**Lon (W)**	**Water depth / m**	**PW**	**Poros / CNS**	**IC**	**ICP-AES / $^{87/86}$Sr**	**DIC / $\delta^{13}C_{DIC}$**	**Iso PW**	**DOC**	**Mn / trace metal**	**AA / N-iso**	**Ligands**	**Core length / cm** GEOMAR / JUB	**No. samples** GEOMAR / JUB
211 ROV PUC 52/26	DEA W EBS rim inside track	7°04.9581'	88°28.1909'	4150	X	X	X	X	X	X	X	X	-	-	20 / 21	12 / 11
211 ROV PUC 73/57	DEA W EBS outside track	7°04.9669'	88°28.1929'	4150	X	X	X	X	X	X	X	X	-	-	15 / 17	10 / 9
216 ROV PUC 65	Reference South	7°07.5224‘	88°27.0625‘	4158	-	-	-	-	-	-	-	-	X	-	- / 21	- / 6
219 ROV PUC 58/79+28	DEA S white patch	7°04.6930'	88°27.4540'	4155	X	X	X	X	X	X	X	X	-	X	21 / 21 (15 Ligands)	13 / 11 (3 Ligands)
219 ROV PUC 75/68	DEA S ripple valley	7°04.6930'	88°27.4540'	4155	X	X	X	X	X	X	X	X	-	-	14 / 21	9 / 11

Table 7.7.2 continued. *List of sampled cores and collected sub-samples.*

Station Device	**Area**	**Lat (S)**	**Lon (W)**	**Water depth / m**	**PW**	**Poros / CNS**	**IC**	**ICP-AES / $^{87/86}$Sr**	**DIC / $\delta^{13}C_{DIC}$**	**Iso PW**	**DOC**	**Mn / trace metal**	**AA / N-iso**	**Ligands**	**Core length / cm** GEOMAR / JUB	**No. samples** GEOMAR / JUB
229 MUC	DEA S outside track	7°04.6970‘	88°27.3970‘	4133	X	X	X	X	X	X	X	X	-	-	39 / 37	21 / 18
232 ROV PUC 64/14	DEA S ripple crest	7°04.6890‘	88°27.4554‘	4156	X	X	X	X	X	X	X	X	-	-	20 / 20	12 / 10

PUC = ROV-deployed push corer; MUC = multiple-corer; PW = porewater analyses of TA, NO_3^-, NO_2^-, NH_4, PO_4, SiO_4; IC = ion chromatography (SO_4, Br, Cl, I); ICP-AES = inductively-coupled atomic emission spectroscopy (for various dissolved cations); $^{87/86}Sr$ = radiogenic Sr isotope ratio in porewater; Iso PW = O, H, Li isotope ratios of porewater; DOC = dissolved organic carbon in porewater; Mn / trace metals = porewater Mn(II/III) and trace metals; AA / N-iso = amino acids and $\delta^{15}N$ of the porewater

Table 7.7.3. *List of cores sampled for x-ray analysis.*

Station Device & Core	**Area Microhabitat**	**Lat (S)**	**Lon (W)**	**Water depth (m)**
154 ROV PUC#20	DEA West Plough Track *crest*	7°4.4126’	88°27.8384’	4098.3
154 ROV PUC#38	DEA West Plough Track *valley*	7°4.4126’	88°27.8384’	4098.3
154 ROV PUC#56	DEA West Plough Track *white spot*	7°4.4118’	88°27.8172’	4100.6
154 ROV PUC#74	DEA West Plough Track *off track undisturbed*	7°4.4009’	88°27.8295’	4099.4
163 ROV PUC#80	DEA East Plough Track *crest*	7°4.4925’	88°26.9338’	4103.9
166 ROV PUC#73	DEA East Plough Track *off track undisturbed*	7°4.4585’	88°26.9241’	4101.8
176 ROV PUC#73	DEA East Plough Track *white spot*	7°4.4797’	88°26.9120’	4103.9
179 ROV PUC#9	DEA East Plough Track *valley*	7°4.4695’	88°26.9138’	4103.0
202 ROV PUC#49	DEA SW EBS & Plough Track *white spot*	7°4.9534’	88°28.1975’	4189.6
205 ROV PUC#31	DEA SW EBS & Plough Track *brown sediment, rim of track*	7°4.9749’	88°28.1745’	4189.3
205 ROV PUC#55	DEA SW EBS & Plough Track *sediment pile just outside track*	7°4.9749’	88°28.1745’	4189.3
213 ROV PUC#10	DEA SW EBS & Plough Track *off track undisturbed*	7°4.9946’	88°28.1904’	4189.6
219 ROV PUC#67	DEA Central Plough Track *white spot*	7°4.6930’	88°27.4541’	4193.7
229 MUC CORE#5	DEA Central Plough Track *off track undisturbed*	7°4.6970‘	88°27.3970‘	4133
232 ROV PUC#49	DEA Central Plough Track *valley*	7°4.6878’	88°27.4553’	4194.7
232 ROV PUC#53	DEA Central Plough Track *crest*	7°4.6878	88°27.4553’	4194.7

7.7.4 Preliminary results

The following brief discussion relates the acquired porewater data to findings from SO242 Leg 1 and the previous cruise SO106 (conducted 19 years ago; see Haeckel et al., 2001).

During Leg 2 4 microhabitats were chosen in the plough marks based on their general appearance of the sediment surface: (1) crest of plough ripples, (2) valley between ripple crests, (3) exposed whitish sediment patches (i.e. the originally suboxic sediment below the dark-brown manganese oxide layer), and (4) a site 10-20 m outside the plough marks that has witnessed presumably little disturbance (except for a some resettling finer sediment particles; but consists of nodules with sessile fauna on them).

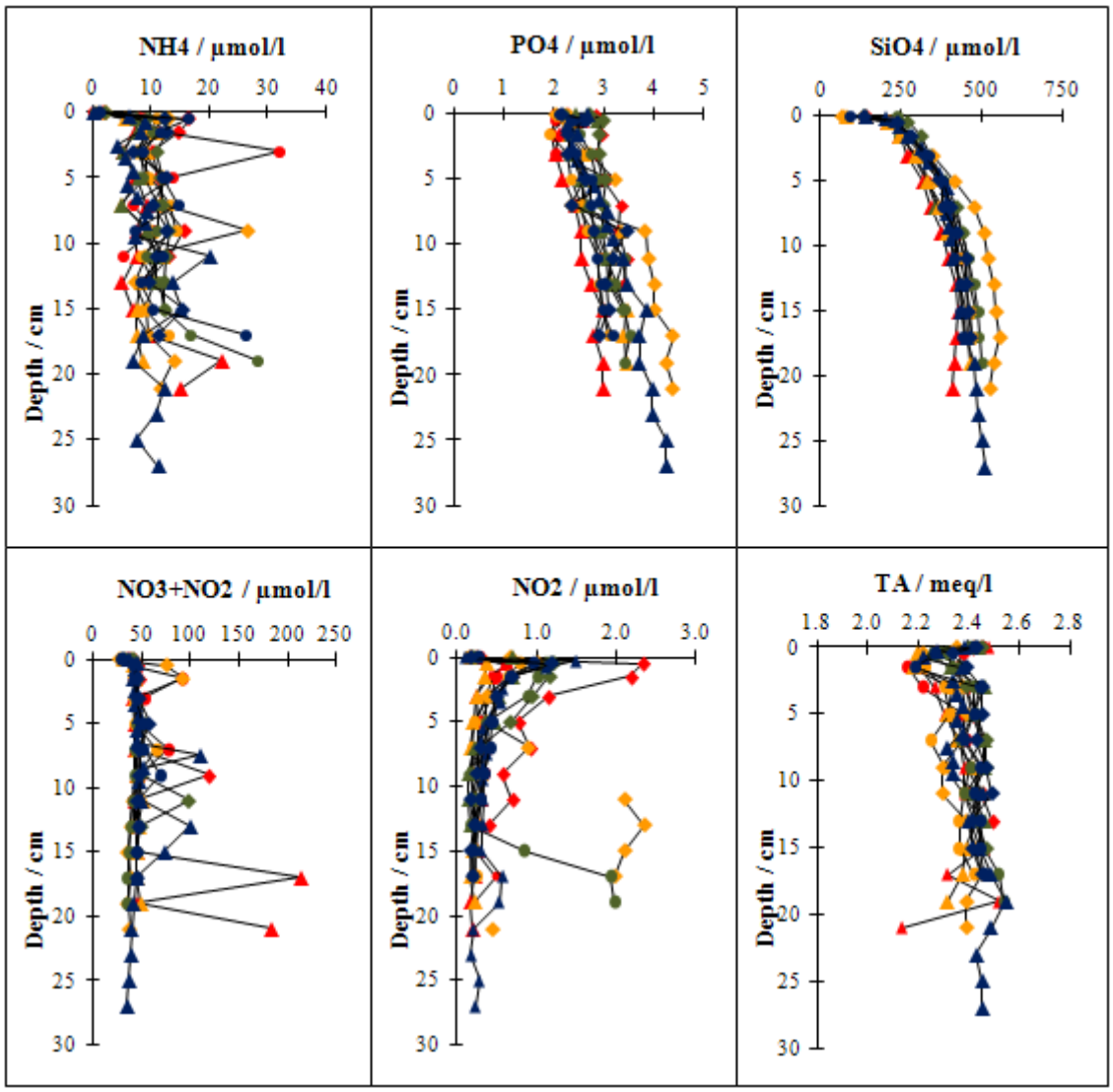


Figure 7.7.2. *Measured concentrations of porewater constituents in cores from the 4 microhabitats (**white patch**, **ripple crest**, **ripple valley**, **outside**) of the western (♦), southern (Δ), and eastern (o) plough mark sites.*

In line with findings from the previous leg, the concentration profiles of the nutrients NH_4, PO_4, SiO_4, and NO_3 exhibit no significant influence from the disturbance of the sediment surface (upper ~10 cm) anymore (Fig. 7.7.2). Their profiles are likely determined by the deeper diagenesis and hence, diffusion has levelled out concentration gradients within 26 years (according to the Einstein-Smoluchowski relation 26 years ≈ 100 cm). However, nitrite profiles show a significant difference between non-impacted and impacted habitats: the zone where nitrite is elevated in the surface sediments is only 3-5 cm at ripple crests and whitish patches compared to 5-10 cm outside the plough marks and in ripple valleys (Fig. 7.7.2). In ripple valleys this may be explained by a cover of resettled sediment. A few cores also exhibit increased subsurface NO_2 concentrations, potentially because here the surface sediment sequence has been completely turned over with brownish manganese oxide now underlaying the originally suboxic Fe(III)-rich clays.

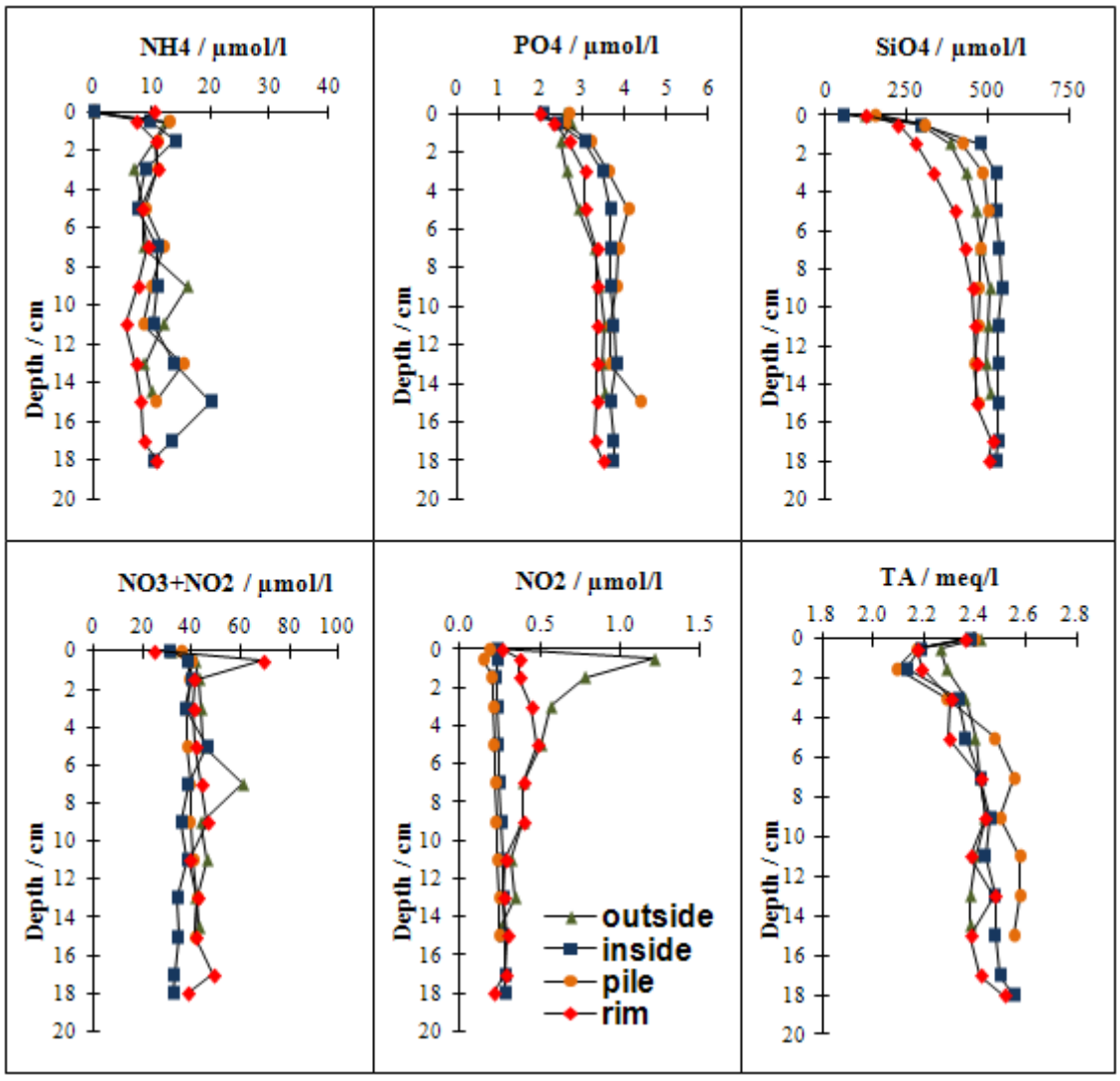


Figure 7.7.3. *Measured concentrations of porewater constituents in cores from the 4 microhabitats of the EBS track (SO242/1 81 EBS 3) in the western DEA.*

In order to fill the existing data gap from freshly disturbed sediment – during the DISCOL campaign the first geochemical data were collected during SO106 seven years after the experiment – sediments from an EBS track towed on Leg 1 (81 EBS 3) were cored in a similar fashion as the old plough marks: (1) inside the track on whitish scratches, (2) at the rim inside the track, (3) in the turned-over sediment piles at the side of the track, and (4) the sediment ~10 m outside the track. Since the EBS track was only towed 5 weeks earlier, a clear difference between impacted and non-impacted sediments is obvious in the NO_2 profiles. While the sediments outside the track show a peak concentration of ~1.2 µM tailing out downcore in 10-15 cm depth, the disturbed “inside track” and “side pile” show absolutely no bacterial activity producing metabolic nitrite (Fig. 7.7.3). The sediments of the rim inside the track also show much lower nitrite concentrations – here only some sediment was eroded and / or fluffy surface sediment has resettled. Dissolved silicate profiles nicely illustrate the ongoing diffusion from the suboxic, silicate-rich sediments (>500 µM) that are now directly exposed to the silicate-poor bottom water (<100 µM), which is slowly levelling out the steep concentration gradient. For reference, the calculated diffusional length-scale for a time of 5 weeks according to Einstein-Smoluchowski is 7-8 cm.

7.8 In situ flux measurements

F Janssen, F Wenzhöfer

The benthic oxygen utilization serves for detailed investigations on the turnover of organic material, fauna activity and the biogeochemical reactions of the sediment. Only a minor part of the oxygen is used for animal respiration, while microbial heterotrophic activity is responsible for the major part of the benthic oxygen requirement in deep sea sediments. Benthic oxygen fluxes provide a good integrated measurement of the respiratory metabolic activity in surface sediments (Glud 2008; Wenzhöfer and Glud, 2002). Oxygen uptake rates can be converted to rates of carbon mineralization, which represents a major function of benthic ecosystems. Carbon mineralization rates also allow for an evaluation of carbon input to the seafloor.

We used a variety of in situ tools either mounted on freefalling lander (see section 7.3) or as ROV-operated systems (see section 7.4) to determine rates of oxygen uptake and solute exchange rates in different benthic habitats of the DEA. Table 7.8.1 lists all deployments and includes information on the specific sites and habitats that were addressed.

Table 7.8.1. *All in situ instrument deployments of MPI / AWI cruise participants dedicated to benthic oxygen uptake and solute exchange measurements (ROV chamber and microprofiler modules, benthic flux lander with chambers and microprofiler, In situ nodule incubation chamber).*

Station	Event label *Instrument*	Deployment start (UTC) *Duration (h)*	Position	Water depth (m)	Area *Habitat & nodule collection site*
ROV chamber modules MPI / AWI					
242-2_142	SO242/2_142_BFC-ROV-#3 *ROV Chamber #3*	31.08.2015 16:03 *4.9*	88:27.8337 W 7:4.4101 S	4138.7	DEA West Plough Track *valley*[1]
242-2_146	SO242/2_146_BFC-ROV-#3 *ROV Chamber #3*	01.09.2015 15:56 *50*	88:27.8306 W 7:4.4099 S	4139.0	DEA West Plough Track *valley*
242-2_146	SO242/2_146_BFC-ROV-#2 *ROV Chamber #2*	01.09.2015 18:44 *48*	88:27.8274 W 7:4.4000 S	4140.1	DEA West Plough Track *off track / undisturbed*
242-2_150	SO242/2_150_BFC-ROV-#1 *ROV Chamber #1*	02.09.2015 16:13 *32*	88:27.8045 W 7:4.4117 S	4101.0	DEA West Plough Track *white patch*
242-2_163	SO242/2_163_BFC-ROV-#3 *ROV Chamber #3*	05.09.2015 15:56 *31*	88:26.9338W 7:4.4925 S	4104.0	DEA East Plough Track *valley*
242-2_166	SO242/2_166_BFC-ROV-#1 *ROV Chamber #1*	06.09.2015 16:57 *31*	88:26.9308 W 7:4.4627 S	4101.3	DEA East Plough Track *off track / undisturbed*
242-2_166	SO242/2_166_BFC-ROV-#2 *ROV Chamber #2*	06.09.2015 17:44 *28*	88:26.9286 W 7:4.4898 S	4103.9	DEA East Plough Track *valley*
242-2_166	SO242/2_166_BFC-ROV-#3 *ROV Chamber #3*	06.09.2015 22:50 *23*	88:26.9359 W 7:4.4926 S	4102.3	DEA East Plough Track *valley*
242-2_176	SO242/2_176_BFC-ROV-#3 *ROV Chamber #3*	09.09.2015 15:34 *34*	88:26.9190 W 7:4.4762 S	4102.3	DEA East Plough Track *white patch*

[1] Instrument failure: no data

Table 7.8.1 continued. *All in situ instrument deployments of MPI / AWI cruise participants dedicated to benthic oxygen uptake and solute exchange measurements*

Station	Event label *Instrument*	Deployment start (UTC) *Duration (h)*	Position	Water depth (m)	Area *Habitat & nodule collection site*
242-2_176	SO242/2_176_BFC-ROV-#1 *ROV Chamber #1*	09.09.2015 16:34 *32*	88:26.9187 W 7:4.4677 S	4102.2	DEA East Plough Track *off track w/o nodule*
242-2_183	SO242/2_183_BFC-ROV-#3 *ROV Chamber #3*	11.09.2015 17:01 *101*	88:27.0257 W 7:7.5160 S	4116.5	Southern Reference *reference*
242-2_183	SO242/2_183_BFC-ROV-#1 *ROV Chamber #1*	11.09.2015 17:26 *102*	88:27.0213 W 7:7.5184 S	4116.9	Southern Reference *reference on nodule*
242-2_188	SO242/2_188_BFC-ROV-#2 *ROV Chamber #2*	12.09.2015 17:04 *101*	88:27.0242 W 7:7.5161 S	4197.4	Southern Reference *reference on nodule*
242-2_188	SO242/2_188_BFC-ROV-#4 *ROV Chamber #4*	12.09.2015 17:11 *101*	88:27.0257 W 7:7.5189 S	4197.4	Southern Reference *reference*
242-2_202	SO242/2_202_BFC-ROV-#1 *ROV Chamber #1*	17.09.2015 18:34 *28*	88:28.1825 W 7:4.9665 S	4186.8	DEA SW EBS & Plough Track *white patch*[1]
242-2_202	SO242/2_202_BFC-ROV-#3 *ROV Chamber #3*	17.09.2015 19:16 *28*	88:28.1730 W 7:4.9787 S	4188.6	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_BFC-ROV-#1 *ROV Chamber #1*	20.09.2015 16:07 *31*	88:28.1580 W 7:4.9904 S	4188.2	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_BFC-ROV-#2 *ROV Chamber #2*	20.09.2015 16:28 *31*	88:28.1553 W 7:4.9937 S	4188.3	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_BFC-ROV-#3 *ROV Chamber #3*	20.09.2015 16:57 *32*	88:28.1510 W 7:4.9987 S	4188.1	DEA SW EBS & Plough Track *white patch*
242-2_219	SO242/2_219_BFC-ROV-#1 *ROV Chamber #1*	23.09.2015 19:37 *28*	88:27.4534 W 7:4.7075 S	4193.8	DEA Central Plough Track *white patch*
242-2_219	SO242/2_219_BFC-ROV-#2 *ROV Chamber #2*	23.09.2015 20:26 *27*	88:27.4541 W 7:4.6930 S	4192.8	DEA Central Plough Track *valley*
242-2_222	SO242/2_222_BFC-ROV-#3 *ROV Chamber #3*	24.09.2015 17:00 *72*	88:27.4553 W 7:4.7035 S	4193.5	DEA Central Plough Track *crest / mound*
242-2_232	SO242/2_232_BFC-ROV-#1 *ROV Chamber #1*	27.09.2015 16:06 *5.4*	88:27.4748 W 7:4.6813 S	4193.2	DEA Central Plough Track *off track on nodule*
242-2_232	SO242/2_232_BFC-ROV-#4 *ROV Chamber #4*	27.09.2015 16:27 *5.3*	88:27.4665 W 7:4.6946 S	4193.5	DEA Central Plough Track *crest / mound*
ROV Profiler modules MPI / AWI					
242-2_146	SO242/2_146_MICP-#1-1 ROV profiler #1	01.09.2015 16:57 *3.1*	88:27.8366 W 7:4.4094 S	4138.6	DEA West Plough Track *valley*
242-2_146	SO242/2_146_MICP-#2-1 ROV profiler #2	01.09.2015 17:48 *3.8*	88:27.8274 W 7:4.4000 S	4140.0	DEA West Plough Track *off track / undisturbed*
242-2_146	SO242/2_146_MICP-#1-2 ROV profiler #1	01.09.2015 20:31 *3.5*	88:27.8366 W 7:4.4094 S	4139.2	DEA West Plough Track *valley*
242-2_146	SO242/2_146_MICP-#2-2 ROV profiler #2	01.09.2015 21:45 *21*	88:27.8274 W 7:4.4000 S	4141.4	DEA West Plough Track *off track / undisturbed*
242-2_146	SO242/2_146_MICP-#1-3 ROV profiler #1	02.09.2015 00:12 *13*	88:27.8498 W 7:4.4089 S	4138	DEA West Plough Track *valley*[1]
242-2_154	SO242/2_154_MICP-#1-1 ROV profiler #1	03.09.2015 15:50 *3.5*	88:27.8172 W 7:4.4118 S	4099.8	DEA West Plough Track *white patch*[1]

Table 7.8.1 continued. *All in situ instrument deployments of MPI / AWI cruise participants dedicated to benthic oxygen uptake and solute exchange measurements*

Station	Event label *Instrument*	Deployment start (UTC) *Duration (h)*	Position	Water depth (m)	Area *Habitat & nodule collection site*
242-2_154	SO242/2_154_MICP-#2-1 ROV profiler #2	03.09.2015 16:26 *2.9*	88:27.8172 W 7:4.4118 S	4100.5	DEA West Plough Track *white patch*
242-2_154	SO242/2_154_MICP-#2-2 ROV profiler #2	03.09.2015 19:18 *3*	88:27.8172 W 7:4.4118 S	4099.7	DEA West Plough Track *white patch*
242-2_154	SO242/2_154_MICP-#1-2 ROV profiler #1	03.09.2015 19:23 *1.7*	88:27.8172 W 7:4.4118 S	4099.7	DEA West Plough Track *white patch*[1]
242-2_166	SO242/2_166_MICP-#1 ROV profiler #1	06.09.2015 16:03 *3.4*	88:26.9376 W 7:4.4912 S	4103.1	DEA East Plough Track *valley*[1]
242-2_166	SO242/2_166_MICP-#2 ROV profiler #2	06.09.2015 16:37 *6.4*	88:26.9376 W 7:4.4912 S	4103.1	DEA East Plough Track *valley*
242-2_169	SO242/2_169_MICP-#1-1 ROV profiler #1	07.09.2015 15:51 *2.9*	88:26.9176 W 7: 4.4563 S	4102.0	DEA East Plough Track *off track / undisturbed*
242-2_169	SO242/2_169_MICP-#2-1 ROV profiler #2	07.09.2015 16:22 *2.6*	88:26.9205 W 7:4.4787 S	4103.6	DEA East Plough Track *valley*
242-2_169	SO242/2_169_MICP-#1-2 ROV profiler #1	07.09.2015 18:51 *3.8*	88:26.9176 W 7:4.4563 S	4100.7	DEA East Plough Track *off track / undisturbed*
242-2_169	SO242/2_169_MICP-#2-2 ROV profiler #2	07.09.2015 19:17 *3.8*	88:26.9102 W 7:4.4820 S	4102.6	DEA East Plough Track *valley*
242-2_176	SO242/2_176_MICP-#1-1 ROV profiler #1	09.09.2015 15:41 *2.3*	88:26.9190 W 7:4.4762 S	4102.8	DEA East Plough Track *white patch*
242-2_176	SO242/2_176_MICP-#2-1 ROV profiler #2	09.09.2015 16:09 *2.3*	88:26.9187 W 7:4.4677 S	4102.0	DEA East Plough Track *off track / undisturbed*
242-2_176	SO242/2_176_MICP-#1-2 ROV profiler #1	09.09.2015 18:06 *3.6*	88:26.9187 W 7:4.4677 S	4102.9	DEA East Plough Track *off track / undisturbed*
242-2_176	SO242/2_176_MICP-#2-2 ROV profiler #2	09.09.2015 18:41 *2.7*	88:26.9088 W 7:4.4800 S	4104.2	DEA East Plough Track *white patch*
242-2_176	SO242/2_176_MICP-#2-3 ROV profiler #2	09.09.2015 21:35 *18*	88:26.9052 W 7:4.4814 S	4102.9	DEA East Plough Track *white patch*
242-2_176	SO242/2_176_MICP-#1-3 ROV profiler #1	09.09.2015 21:51 *18*	88:26.9149 W 7: 4.4683 S	4101.9	DEA East Plough Track *off track / undisturbed*
242-2_179	SO242/2_179_MICP-#2-1 ROV profiler #2	10.09.2015 15:23 *9.7*	88:26.9003 W 7:4.4800 S	4103.8	DEA East Plough Track *white patch*
242-2_179	SO242/2_179_MICP-#1-1 ROV profiler #1	10.09.2015 16:10 *8.4*	88:26.9138 W 7:4.4695 S	4102.6	DEA East Plough Track *off track / undisturbed*
242_2_202	SO242/2_202_MICP-#1-1 ROV profiler #1	17.09.2015 17:40 *3.3*	88:28.1825 W 7:4.9665 S	4188.2	DEA SW EBS & Plough Track *white patch*
242_2_202	SO242/2_202_MICP-#2-1 ROV profiler #2	17.09.2015 18:11 *2.9*	88:28.1773 W 7:4.9732 S	4188.1	DEA SW EBS & Plough Track *white patch*
242_2_202	SO242/2_202_MICP-#1-2 ROV profiler #1	17.09.2015 21:04 *2.7*	88:28.1825 W 7:4.9665 S	4188.5	DEA SW EBS & Plough Track *white patch*
242_2_202	SO242/2_202_MICP-#2-2 ROV profiler #2	17.09.2015 21:13 *2.7*	88:28.1773 W 7:4.9732 S	4188.5	DEA SW EBS & Plough Track *white patch*
242_2_202	SO242/2_202_MICP-#1-3 ROV profiler #1	17.09.2015 23:47 *18*	88:28.1825 W 7:4.9665 S	4188.7	DEA SW EBS & Plough Track *off track / undisturbed*

Table 7.8.1 continued. *All in situ instrument deployments of MPI / AWI cruise participants dedicated to benthic oxygen uptake and solute exchange measurements*

Station	Event label *Instrument*	Deployment start (UTC) *Duration (h)*	Position	Water depth (m)	Area *Habitat & nodule collection site*
ROV chamber modules MPI / AWI					
242_2_202	SO242/2_202_MICP-#2-3 ROV profiler #2	18.09.2015 00:03 *18*	88:28.1918 W 7:4.9562 S	4188.4	DEA SW EBS & Plough Track *sediment piles next to track*[1]
242-2_205	SO242/2_205_MICP-#1 ROV profiler #1	18.09.2015 17:28 *4.6*	88:28.1958 W 7:4.9531 S	4188.5	DEA SW EBS & Plough Track *white patch*
242-2_205	SO242/2_205_MICP-#2-1 ROV profiler #2	18.09.2015 17:43 *3*	88:28.1950 W 7:4.9536 S	4188.4	DEA SW EBS & Plough Track *white patch*
242-2_205	SO242/2_205_MICP-#2-2 ROV profiler #2	18.09.2015 21:12 *3*	88:28.1871 W 7:4.9628 S	4188.6	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_MICP-#1-1 ROV profiler #1	20.09.2015 15:38 *3*	88:28.1622 W 7:4.9858 S	4188.2	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_MICP-#1-2 ROV profiler #1	20.09.2015 18:53 *2.9*	88:28.1510 W 7:4.9987 S	4187.5	DEA SW EBS & Plough Track *white patch*
242-2_211	SO242/2_211_MICP-#1-3 ROV profiler #1	20.09.2015 21:49 *18*	88:28.1510 W 7:4.9987 S	4188.1	DEA SW EBS & Plough Track *white patch*
242-2_213	SO242/2_213_MICP-#2-1 ROV profiler #2	21.09.2015 16:02 *4*	88:28.1526 W 7:5.0220 S	4189.2	DEA SW EBS & Plough Track *off track / undisturbed*
242-2_213	SO242/2_213_MICP-#1-1 ROV profiler #1	21.09.2015 16:23 *3.3*	88:28.1425 W 7:5.0031 S	4187.8	DEA SW EBS & Plough Track *white patch*
242-2_213	SO242/2_213_MICP-#1-2 ROV profiler #1	21.09.2015 19:50 *4.8*	88:28.1239 W 7:4.9727 S	4187.3	DEA SW EBS & Plough Track *white patch*
242-2_213	SO242/2_213_MICP-#2-2 ROV profiler #2	21.09.2015 20:12 *5.3*	88:28.1479 W 7:5.0342 S	4188.9	DEA SW EBS & Plough Track *off track / undisturbed*
242-2_216	SO242/2_216_MICP-#2-1 ROV profiler #2	22.09.2015 17:07 *3.2*	88:27.0396 W 7:7.5227 S	4197.5	Southern Reference *refer. with nodule removed*
242-2_216	SO242/2_216_MICP-#2-2 ROV profiler #2	22.09.2015 20:42 *2.2*	88:27.0494 W 7:7.5504 S	4198.4	Southern Reference *refer. with nodule removed*
242-2_219	SO242/2_219_MICP-#1-1 ROV profiler #1	23.09.2015 18:34 *2.2*	88:27.4541 W 7:4.6930 S	4193.5	DEA Central Plough Track *white patch*
242-2_219	SO242/2_219_MICP-#2-1 ROV profiler #2	23.09.2015 19:47 *2.6*	88:27.4709 W 7:4.6874 S	4193.0	DEA Central Plough Track *valley*
242-2_219	SO242/2_219_MICP-#1-2 ROV profiler #1	23.09.2015 20:56 *4.4*	88:27.4541 W 7:4.6930 S	4193.3	DEA Central Plough Track *crest / mound*
242-2_219	SO242/2_219_MICP-#2-2 ROV profiler #2	23.09.2015 22:37 *3.1*	88:27.4808 W 7:4.7197 S	4192.0	DEA Central Plough Track *off track / undisturbed*
242-2_219	SO242/2_219_MICP-#1-3 ROV profiler #1	24.09.2015 01:33 *16*	88:27.4516 W 7: 4.6874 S	4193.4	DEA Central Plough Track *crest / mound*
242-2_219	SO242/2_219_MICP-#2-3 ROV profiler #2	24.09.2015 01:46 *16*	88:27.4808 W 7:4.7197 S	4192.2	DEA Central Plough Track *off track / undisturbed*
242-2_222	SO242/2_222_MICP-#1-1 ROV profiler #1	24.09.2015 18:08 *2.4*	88:27.4505 W 7:4.6844 S	4193.8	DEA Central Plough Track *crest / mound*
242-2_222	SO242/2_222_MICP-#2-1 ROV profiler #2	24.09.2015 18:29 *3*	88:27.5033 W 7:4.7044 S	4192.5	DEA Central Plough Track *white patch*

Table 7.8.1 continued. *All in situ instrument deployments of MPI / AWI cruise participants dedicated to benthic oxygen uptake and solute exchange measurements*

Station	Event label *Instrument*	Deployment start (UTC) *Duration (h)*	Position	Water depth (m)	Area *Habitat & nodule collection site*
242-2_222	SO242/2_222_MICP-#1-2 ROV profiler #1	24.09.2015 21:04 *2.9*	88:27.4669 W 7:4.6793 S	4193.9	DEA Central Plough Track *refer. with nodule removed*
242-2_222	SO242/2_222_MICP-#2-2 ROV profiler #2	24.09.2015 21:37 *3.1*	88:27.4827 W 7:4.6969 S	4192.5	DEA Central Plough Track *white patch*
Flux Lander MPI / AWI					
242-2_141	SO242/2_141_LANDER-#1 *Chamber & Profiler lander*	31.08.2015 11:30 *69*	-88:27.0473 -7:4.6017	4149	Undisturbed in East DEA *undisturbed area*[1]
242-2_158	SO242/2_158_LANDER-#1 *Chamber & Profiler lander*	04.09.2015 20:08 *58*	-88:26.9740 -7:7.4590	4155	Southern Reference *reference area*
242-2_159	SO242/2_159_LANDER-#2 *Chamber & Profiler lander*	04.09.2015 21:58 *60*	-88:24.7774 -7:5.9822	4203	Eastern Reference *reference area*
242-2_186	SO242/2_186_LANDER-#1 *Chamber & Profiler lander*	12.09.2015 13:26 *63*	-88:31.60458 -7:4.5689	4141	Western Reference *reference area*
242-2_187	SO242/2_187_LANDER-#2 *Chamber & Profiler lander*	12.09.2015 14:00 *65*	-88:28.4637 -7:4.7069	4137	SW DEA near EBS tracks *undisturbed area*
242-2_225	SO242/2_225_LANDER-#1 *Chamber & Profiler lander*	25.09.2015 18:54 *60*	-88:17.1000 -7:3.9500	4147	E DEA low backscatter area *undisturbed w/o nodules*
In situ nodule incubation system MPI / AWI					
242_2-176	SO242/2_176_ISCHAM-#1 *Nodule chamber #1*	09.09.2015 17:08 *35*	-88:26.9403 -7:4.4545	4101	DEA East Plough Track *off track / undisturbed*
242_2-176	SO242/2_176_ISCHAM-#2 *Nodule chamber #2*	09.09.2015 17:41 *34*	-88:26.9403 -7:4.4545	4101	DEA East Plough Track *off track / undisturbed*
242_2-176	SO242/2_176_ISCHAM-#3 *Nodule chamber #3*	09.09.2015 19:36 *32*	-88:26.9403 -7:4.4545	4101	DEA East Plough Track *off track / undisturbed*
242_2-196	SO242/2_176_ISCHAM-#3 *Nodule chamber #3*	15.09.2015 16:08 *33*	-88:27.0451 -7:7.5242	4196	Southern Reference *reference area*
242_2-196	SO242/2_176_ISCHAM-#2 *Nodule chamber #2*	15.09.2015 16:28 *33*	-88:27.0451 -7:7.5242	4196	Southern Reference *reference area*
242_2-196	SO242/2_176_ISCHAM-#1 *Nodule chamber #1*	15.09.2015 16:53 *32*	-88:27.0451 -7:7.5242	4196	Southern Reference *reference area*
242_2-202	SO242/2_176_ISCHAM-#3 *Nodule chamber #3*	17.09.2015 16:08 *80*	-88:28.1738 -7:4.9715	4188	DEA SW EBS & Plough Track *off track / undisturbed*
242_2-202	SO242/2_176_ISCHAM-#2 *Nodule chamber #2*	17.09.2015 16:34 *79*	-88:28.1738 -7:4.9715	4188	DEA SW EBS & Plough Track *off track / undisturbed*
242_2-202	SO242/2_176_ISCHAM-#1 *Nodule chamber #1*	17.09.2015 16:56 *79*	-88:28.1738 -7:4.9715	4188	DEA SW EBS & Plough Track *off track / undisturbed*

The two MPI-Benthic-Flux Lander were deployed 6 times, mainly at reference sites outside the DEA circle (Tab. 7.8.1) providing 15 total oxygen uptake rate measurements and > 75 oxygen microprofiles and several pH and NOx profiles. ROV-operated measurements inside the DEA included 51 ROV-profiler and 24 ROV-chamber deployments covering all identified micro-habitats in the plough and EBS tracks (crest, valley, white spots) and outside the tracks. In order to investigate the

relevance of nodules for benthic fluxes, chambers incubations took place both with and without nodules. To address the immediate effect of nodule removal, profilers were positioned at sites were nodules were removed beforehand. These data will be combined with the oxygen uptake rates of the nodules and the associated fauna as determined with the In situ nodule incubation system ‘Knolle’

Preliminary results reveal a deeper oxygen penetration at the reference site compared to the ploughed habitats inside the track. Examples of oxygen profiles are shown in Fig. 7.8.1. The left panel represents a typical profile from the area outside the DEA in undisturbed sediments. Compared to the two examples from inside the plough track, oxygen penetrates deep into the sediment with higher oxygen consumption below the sediment surface and a more linear (i.e., diffusion- rather than consumption-dominated) behaviour deeper in the sediment.

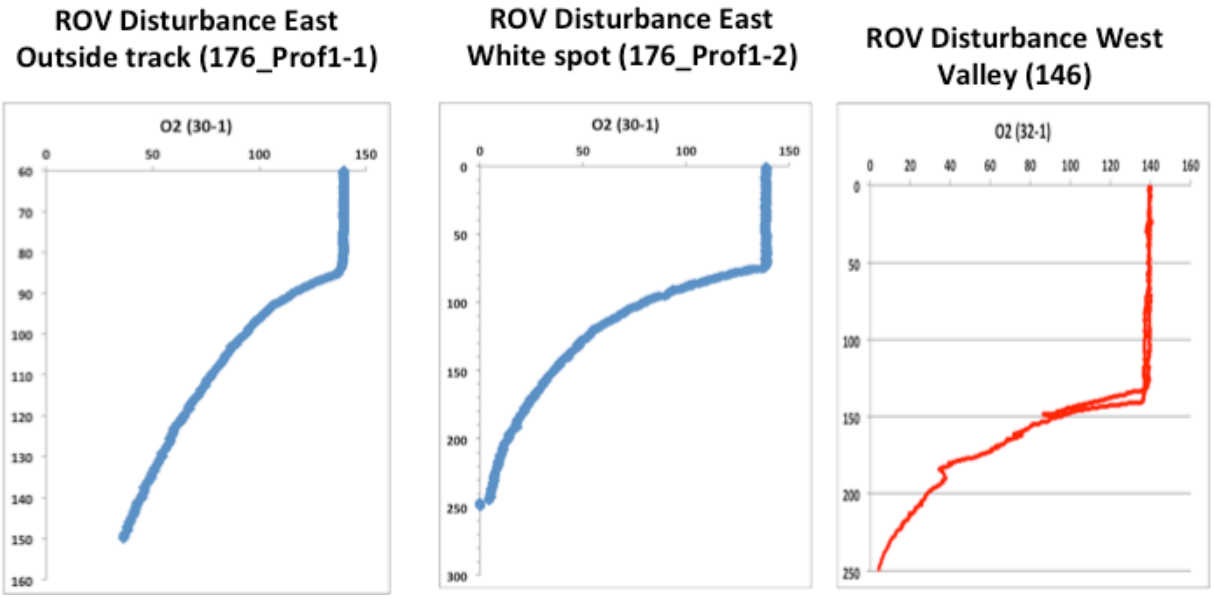


Fig. 7.8.1. *Example of oxygen profiles from different habitats of the DEA.*

7.9 Microbiology

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7.9.1 Introduction

For microbial analyses sediment and manganese nodule samples were taken from multiple corer (MUC) cores and push cores (PUC). Three different reference areas, three DEA areas and the new EBS track were sampled (Table 7.9.1; Table 7.9.2). Due to the heterogeneity of the plough tracks of the DEA and EBS tracks, specific habitats were sampled with the ROV; 1) the ripples that were piled up during the ploughing; 2) the valleys between the ripples; 3) white patches in the tracks, indicating sediments from deeper layers; and 4) undisturbed sites next to the tracks. Undisturbed reference sites will be compared with the old tracks of the DEA area and the new EBS tracks. In spite of the importance of the microbial community for deep sea sediment geochemistry and the remineralisation of organic material, the effects of deep sea mining on them have been neglected, so far. The microbial analyses include measurements of their activity, diversity and abundances, and the physical and chemical conditions around them.

The aim of the study is to investigate the impact of disturbances of the deep sea bottom on the microbial community and the potential for its recovery 26 years after the initial DISCOL experiment in 1989. In the following chapter the work on board RV Sonne and the planned analyses at the Max-Planck Institute for Marine Microbiology in Bremen are described.

7.9.2 *General sample preparation*

For the microbial analyses sediment samples and a few manganese nodules were used and subsampled for different methods. The sediments for the disturbed areas were taken from the push cores collected with the ROV Kiel 6000. The sediments from the reference areas were taken from the MUC cores taken with the Multicorer. Manganese nodules were either collected from the MUC cores or from the nodule respiration chambers. The cores were sliced into 5 different layers (0-1 cm, 1-2 cm, 2-3 cm, 3-5 cm, and 14-16cm) at 2°C and subsampled for a variety of methods which are described in the following sections. For a few analyses small manganese nodules or a part of the crust of larger nodules were crushed and prepared for uptake measurements, fluorescence in situ hybridisations and DNA analyses. Full nodules were collected from the MUC cores and either frozen at -20°C or stored at 4°C in sterile filtrated seawater for further investigations of the spatial organisation of microbes within the nodule.

7.9.3 Microbial abundances (AODC)

For the microbial abundances sediment samples were prepared for the acridine orange direct count method (AODC). 2 ml sediment were fixed in 9 ml of 0.22 µm sterile filtrated bottom water containing 4% formalin. The samples were then stored at

4°C. Back in Germany the cell number per ml of sediment will be counted under an epifluorescence microscope after filtration and staining with acridine orange.

7.9.4 Fluorescence in situ hybridisation (FISH)

The microbial community structure will be investigated via the fluorescence in situ hybridisations method (FISH). 2 ml of the AODC samples were subsampled after 4 h. The subsamples were washed 2 times with PBS to remove the formalin. The sample was then stored in a 1:1 mixture of PBS/ethanol at -20°C. Back in Germany the bacterial and archaeal cells will be hybridized with taxa specific probes and colored with fluorescent dyes in order to count the abundances of the different taxa.

7.9.5 DNA and RNA analyses

For comparisons of the microbial communities using the 16s rRNA genes, and for sequencing of different target regions a part of the sediment was subsampled for DNA analyses. 10 ml of sediment were transferred into a 15 ml falcon tube and stored at -20°C. Back in Germany the DNA of these samples will be extracted and processed further.

For comparisons of the gene expression (transcriptomics) a part of the sediment was subsampled for RNA analyses. 10 ml of sediment was transferred into a 15 ml falcon tube. The sample was frozen immediately in liquid nitrogen and stored at -80°C. Back in Germany the RNA of these samples will be extracted and processed further.

7.9.6 Extracellular enzymatic activity (EEA)

As a first measurement for the microbial activity and their capability of using different substrates via extracellular enzymes the EEA was measured directly on board after slicing the cores. First, a slurry of sediment and sterile filtrated seawater (1:1 ratio) was prepared. Then, specific substrates that release a fluorochrome when cleaved were added, and the samples were incubated at 2°C for 1h, 3h and 5h. Subsamples were taken and the increase of fluorescence over time was measured in a fluorescence spectrophotometer and correlated to enzymatic activity via calibration curves. Four different substrates, which can be cleaved by β-glucosidase, chitobiase, aminopeptidase and esterase were used. The first results indicate already a lower activity of most enzymes in the white patches in the DEA and the EBS tracks, even after 26 years.

7.9.7 Sediment properties (Chlorophyll a, porosity, TOC)

For measurements of different parameters of the sediment, samples were prepared for Chlorophyll a, porosity, and total organic carbon measurements. The Chlorophyll a concentration shows the amount of phytoplankton that was transported into the deep sea. The Phaeophytin content that will be measured after acidification of the extracted Chlorophyll a measurements indicates the process of degradation. On

board 5 ml of sediment were sampled with a cut-off syringe. The syringe was sealed with a cap and wrapped in aluminium foil. The sample was then stored at -20°C. Back in Germany the Chlorophyll a and Phaeophytin concentrations will be measured.

The porosity, or pore water space, can have different impacts on nutrient fluxes, and microhabitat sizes. For porosity measurements 4 ml of sediment were sampled with a cut-off syringe. The syringe was sealed with a cap and stored at +4°C. Back in Germany the pore water volume (porosity) will be measured.

The total organic carbon (TOC) content indicates the biomass and the availability of organic carbon for microbial remineralisation in the sediment. 1 ml of sediment was transferred into a glass vial and stored at -20°C. Back in Germany the total organic carbon (TOC) content will be measured.

For phospholipds analyses 5 – 30 ml of sediment were transferred into a 50 ml plastic tube and stored at -20°C. Back in Germany the phospholipid composition will be investigated.

7.9.8 Heterotrophic and autotrophic biomass production

For estimating the CO_2 fixation rates 1ml of slurry of the sediment or crushed manganese nodules and sterile-filtrated bottom seawater was incubated with 12 µl ^{14}C-labelled sodium bicarbonate for 24 h at 2-4°C in the dark and stopped with 2% formalin in seawater. Back in Germany the CO_2 that was fixed by the microbes will be measured after removing the bicarbonate via acidification.

For measuring the general bacterial activity 1ml of slurry of the sediment or crushed manganese nodules and sterile filtrated bottom seawater was incubated with 7.5 µl ^{3}H labelled and 18.75 µl 20 µM non-labelled leucine for 2 h at 2-4°C in the dark and stopped with 98% Ethanol afterwards. Back in Germany the leucine that was taken up by the microbes will be measured.

A time series with different incubation times will be used to test for the time during which the substrate is taken up linearly. A series of leucine incubations with different non-labelled leucine concentrations will be used to estimate the natural leucine concentration in the sediment and to test the leucine concentration with the maximum uptake rate.

Tracer-FISH is a method to identify the bacterial taxa that are responsible for the leucine or CO_2 uptake. A few samples were incubated as described for the CO_2 fixation and bacterial activity. The samples were incubated for 2h and 6h for the leucine uptake and 24h and 72 h for the CO_2 uptake. All samples were killed with 2% Formaldehyde and incubated for 4-8h at 4°C before washing 3 times with sterile filtrated seawater and storage in PBS/Ethanol (1:1 ratio) at -20°C. Back in Germany we will use the FISH method to mark the different taxa, which will then be sorted via fluorescence assisted cell-sorting (FACS). The content of radiotracer will then be measured in the different taxa with a scintillation counter.

A biomass experiment was done in order to convert the uptake rates into heterotrophic and autotrophic biomass productions. 200 ml of the sediment was sieved to remove the meiofauna grazers. 600 ml of sediment was autoclaved to kill all organisms, including viruses and grazer and to get a substrate for the experiment. The sieved sediment, the autoclaved sediment and 750 ml of sterile filtrated bottom seawater was put into a glass bottle and incubated at 2-4°C. Every 24 h subsamples for the CO_2 and leucine uptake incubations and for AODC cell counts were taken and processed as described above for 24 days. Back in Germany the biomass production will be related to the uptake of leucine and CO_2. This will help to convert the measured CO_2 and leucine uptake rates to heterotrophic and autotrophic biomass production. DNA samples were taken in the beginning and the end of the experiment in order to test for a changing community structure due to the artificial conditions in the incubator.

Table 7.9.1 *Sampled stations and cores for the microbial analyses. All subsampling and analyses described in chapters 7.9.3 – 7.9.6 were done on all sediment cores. The tracer experiments described in chapter 7.9.7 are mentioned in the table. The extra samples were sliced and frozen in a whirl bag for later analyses. For each station 3 PUCs or 1-2 MUC cores were pooled as one replicate and three of these replicates were taken (A,B,C). The station coordinates and specifications are given in Appendix 11.B.*

station	gear	core ID	Rep.	site	habitat	Tracer exp.
SO242/2_142	PUC	18,34,46	A	DEA W	ripples	activity all layers, tracer FISH
		24,53	B			
		12,14,55	C			
SO242/2_163	PUC	13,18,24	A	DEA E	ripples	activity 0-1cm
		33,55,74	B			
		9,20,79	C			
SO242/2_232	PUC	23,59,70	A	DEA C	Ripple crest	activity 0-1cm
		36,51,66	B			
		50,52,71	C			
SO242/2_146	PUC	73,74,57	A	DEA W	undisturbed	activity 0-1cm
		50,56,82	B			
		59,62,49	C			
SO242/2_166	PUC	50,56,75	A	DEA E	undisturbed	activity all layers, tracer FISH
		58,59,66	B			
		68,72,77	C			
SO242/2_229	MUC	6,7	A	DEA C	undisturbed	activity 0-1cm
		4,10	B			
		8,9	C			
		2,1	extra			frozen at -20°C
SO242/2_150	PUC	13,24,46	A	DEA W	ripple valley	activity 0-1cm
		9,80,45	B			
		23,18,53	C			
SO242/2_169	PUC	9,18,49	A	DEA E	ripple valley	activity 0-1cm
		20,55,67	B			
		24,33,57	C			

Table 7.9.1 continued. *Sampled stations and cores for the microbial analyses.*

station	gear	core ID	Rep.	site	habitat	Tracer exp.
SO242/2_222	PUC	5,12,25	A	DEA C	ripple valley	activity 0-1cm
		24,34,35	B			
		22,37,47	C			
SO242/2_154	PUC	49,59,62	A	DEA W	white patch	activity 0-1cm
		58,50,73	B			
		76,77,82	C			
SO242/2_176	PUC	50,72,82	A	DEA E	white patch	activity 0-1cm
		38,75,77	B			
		56,70	C			
SO242/2_219	PUC	36,70,77	A	DEA S	white patch	activity 0-1cm
		10,48,51	B			
		21,30,61	C			
		20	extra			frozen at -20°C
SO242/2_147	MUC	9	A	Ref.	few nodules	Biomass exp.
SO242/2_148	MUC	10	B	Ref.	few nodules	Biomass exp.
		9,12,3,6,8	extra			frozen at -20°C
SO242/2_151	MUC	7	C	Ref.	few nodules	Biomass exp.
SO242/2_194	MUC	1,4	A	Ref.	few nodules	activity all layers, tracer FISH
		2,5	B			
		3,6	C			
		7.8.9.10,11,12	extra			frozen at -20°C
SO242/2_208	MUC	1,4	A	Ref.	few nodules	activity 0-1cm
		2,5	B			
		3,7	C			
		6,8,9,10,11	extra			frozen at -20°C

Table 7.9.1 continued. *Sampled stations and cores for the microbial analyses.*

station	gear	core ID	Rep.	site	habitat	Tracer exp.
SO242/2_202	PUC	57,60,74	A	EBS	white scratch	activity 0-1cm
		33,65,69	B			
		17,52,76	C			
		9	extra			frozen at -20°C
SO242/2_211	PUC	35,65,74	A	EBS	rim of track	activity 0-1cm, Tracer FISH
		5,32,69	B			
		17,25,37	C			
		33, 60	extra			Frozen at -20°C

Table 7.9.2. *Sampled manganese nodules from the PUCs, MUC cores, or Nodule respiration chamber (ISCHAM) for microbial analysis.*

station	gear	core ID	site	habitat	layer	processing
SO242/2-222	PUC	37	DEA C	ripple valley	2-5cm	4°C in SW
SO242/2-208	MUC	6	Ref S	few nodules	3cm	4°C in SW
		1			2-3cm	4°C in SW
		2			0-3cm	4°C in SW
		9				-20°C
SO242/2-194	MUC	7	Ref	few nodules	surface	4°C
		9			3cm	Activity, tracer-FISH, FISH, AODC, DNA
		10			3cm	4°C
		8				4°C
SO242/2-196	ISCHAM	1	EBS	undisturbed	surface	Activity, tracer-FISH, FISH, AODC, DNA
		2	EBS	undisturbed	surface	Activity, tracer-FISH, FISH, AODC, DNA

7.10 Megafauna DNA

Alastair Brown, Lisa Mevenkamp

Introduction

Spatial patterns of genetic divergence in the deep sea are relatively unexplored. The aim of the SO242/2 megafauna sampling was to explore spatial patterns of genetic divergence in the Peru Basin, and compare with those in Clarion Clipperton Fracture Zone.

Sampling procedure and processing

Benthic organisms were sampled using the ROV suction pump and manipulator. Tissue samples were taken for DNA analysis and preserved in RNAlater (munnopsids) or ethanol. The remainder of each sample was preserved as a voucher specimen. Echinoderms were fixed in formalin for 48 h prior to preservation in ethanol, other taxa were preserved directly in ethanol. Samples were preserved at -20°C (munnopsids) or 4°C. Samples will be distributed to the University of Hamburg (munnopsids; Angelika Brandt), Institute of Research Stavanger (salps; Andrew Sweetman), or the Senckenberg Institute (Pedro Martinez). Stations from which the various samples were sampled is given in Tab. 7.10.1.

Samples

Megafauna sampled during food web and ecotoxicology experiments are detailed in the relevant cruise report sections.

Table 7.10.1. *Megafauna sampling during SO242/2.*

Station	Sampling device	Taxa
SO242/2_D142-	ROV-NET-	holothuria#1
	ROV-SLURP1-	holothuria#2
SO242/2_D154-	ROV-COLBOX-	porifera#1
	ROV-COLBOX-	ophiuroid#1
SO242/2_D163-	ROV-COLBOX-noduleA	asteroid#1
	ROV-COLBOX-noduleA	porifera#1
SO242/2_D176-	ROV-SLURP-	porifera#1
	ROV-SLURP-	porifera#2
	ROV-SLURP-	porifera#3
	ROV-SLURP-	ophiuroid#1
	ROV-SLURP-	ophiuroid#2
	ROV-SLURP-	crinoid#1
	ISCHAM-NODULE2-	porifera#1
	ISCHAM-NODULE3-	porifera#1
	ROV-COLBOX-	salp+amphipods
SO242/2_D179-	ROV-COLBOX-	salp
SO242/2_D191-	ROV-SCOOP-	ophiuroid#1
	ROV-SCOOP-	porifera#1
SO242/2_D196-	ISCHAM-NODULE3-	porifera#1

Table 7.10.1 continued. *Megafauna sampling during SO242/2.*

Station	Sampling device	Taxa
SO242/2_D202-	ISCHAM-NODULE1-	crinoid#1
	ISCHAM-NODULE1-	porifera#1
	ISCHAM-NODULE2-	porifera#1
	ISCHAM-NODULE3-	porifera#1
SO242/2_204-	CTD-	salp
SO242/2_D205-	ROV-SLURP5-	munnopsid#5
	ROV-SLURP6-	munnopsid#6
	ROV-SLURP7-	munnopsid#7
SO242/2_D211-	ROV-COLBOX-	porifera#1
	ROV-COLBOX-	porifera#2
	ROV-SLURP-	munnopsid#3
	ROV-SLURP-	munnopsid#5
	ROV-SLURP-	munnopsid#1
SO242/2_D213-	ROV-SCOOP-noduleA-	porifera#1
	ROV-SCOOP-noduleA-	alcyonacea#1
	ROV-SCOOP-noduleA-	actinaria#1
	ROV-SCOOP-noduleB-	porifera#1
SO242/2_D216-	ROV-SLURP2-	parapagurus#1
	ROV-SLURPE-	munnopsid#E
SO242/2_D222-	ROV-COLBOX-	crinoid#1
	ROV-COLBOX-	ophiuroid#1
	ROV-COLBOX-	ophiuroid#2
	ROV-COLBOX-	parapagurus#1
	ROV-COLBOX-	pagapagrus_actinaria#1
	ROV-COLBOX-	porifera#1
	ROV-COLBOX-	sipuncula#1
	ROV-COLBOX-noduleA-	porifera#1
	ROV-COLBOX-noduleB-	alcyonacea#1
	ROV-COLBOX-noduleB-	porifera#1
	ROV-COLBOX-noduleB-	porifera#2
	ROV-COLBOX-noduleC-	porifera#1
	ROV-SLURP1-	munnopsid#1
	ROV-SLURP2-	munnopsid#2
	ROV-SLURP3-	munnopsid#3
SO242/2_D232-	ROV-COLBOX-noduleA-	porifera#1
	ROV-COLBOX-noduleA-	porifera#2

7.11 Macrofauna & Meiofauna

Lidia Lins

Introduction

Future mining of manganese nodules in the deep sea raised the question whether its exploitation would affect the fauna dwelling next or on top of these manganese nodules. In order to investigate possible future deep-sea mining impacts, samples for macrofauna and meiofauna were collected in reference and previously impacted areas of the DISCOL and aim to explore community differences between the two sites.

Macrofauna

Samples for macrofauna were collected with the MPI lander (for more information concerning gear description see section 7.3) in the Southern, Eastern and Western Reference areas, as well as in the Southwest of DEA (Tab. 7.11.1). The lander is equipped with three chambers of 20 x 20 cm. After retrieved, samples were immediately sieved with a 500 mm mesh sieve and stored in 4 % formalin.

Meiofauna

For meiofauna, samples were collected with the MUC (see section 7.5), MPI lander (see section 7.3) and push corers (Tab. 7.11.1). MUC samples were collected in the Eastern Reference area and were sliced and stored in formalin or frozen at -20°C/ -80°C. The MUC sampling for meiofauna was conducted to supplement the first leg SO242/1 sampling. Meiofauna samples from the MPI lander were performed with a push corer inside each of the three lander chambers. Samples were sliced into 0-2 cm and 2-5 cm and immediately stored in formalin 4 %.

Push corers from different micro environments were sampled for meiofauna with the ROV, including reference areas and areas impacted by old and new trawling, including ripples (ripple crests and valleys) and white spots (probably deeper sediment brought to the surface by ploughing impact). Samples were sliced into 0-1 cm, 1-2 cm and 2-5 cm.

Table 7.11.2. *Overview of the sampled stations*

Station	Date	Area	Description	Slice interval (cm)	Core Id.	Analysis	Fixation
147	2/09/2015	E Reference	MUC	0-5	1	Meiofauna	Formol
				0-5	2	Meiofauna	Formol
				0-5	3	Meiofauna	Formol
				0-5	4	Meiofauna	Formol
				0-5	5	Pigments/TOM-TOC	-80°C/-20°C
				0-5	6	DNA	-80°C
148	2/09/2015	E Reference	MUC	0-5	1	Meiofauna	Formol
				0-5	2	Meiofauna	Formol
				0-5	3	Meiofauna	Formol
				0-5	4	Meiofauna	Formol
				0-5	5	Pigments/TOM-TOC	-80°C/-20°C
				0-5	6	DNA	-80°C
150	2/09/2015	W DEA	PUC,Outside Track	0-1	12	Meiofauna	Formol
				1-2	12	Meiofauna	Formol
				2-5	12	Meiofauna	Formol
				0-1	33	Meiofauna	Formol
				1-2	33	Meiofauna	Formol
				2-5	33	Meiofauna	Formol
				0-1	34	Meiofauna	Formol
				1-2	34	Meiofauna	Formol
				2-5	34	Meiofauna	Formol
			PUC,Inside track, on ripple	0-1	55	Meiofauna	Formol
				1-2	55	Meiofauna	Formol
				2-5	55	Meiofauna	Formol
				0-1	14	Meiofauna	Formol
				1-2	14	Meiofauna	Formol
				2-5	14	Meiofauna	Formol
				0-1	48	Meiofauna	Formol
				1-2	48	Meiofauna	Formol
				2-5	48	Meiofauna	Formol
151	3/09/2015	E Reference	MUC	0-5	1	Meiofauna	Formol
				0-5	2	Meiofauna	Formol
				0-5	3	Meiofauna	Formol
				0-5	4	Meiofauna	Formol
				0-5	5	Pigments/TOM-TOC	-80°C/-20°C
				0-5	6	DNA	-80°C

Table 7.11.3 continued. *Overview of the sampled stations*

Station	Date	Area	Description	Slice interval (cm)	Core Id.	Analysis	Fixation
154	3/09/2015	W DEA	PUC,white spots	0-1	71	Meiofauna	Formol
				1-2	71	Meiofauna	Formol
				2-5	71	Meiofauna	Formol
				0-1	79	Meiofauna	Formol
				1-2	79	Meiofauna	Formol
				2-5	79	Meiofauna	Formol
				0-1	83	Meiofauna	Formol
				1-2	83	Meiofauna	Formol
				2-5	83	Meiofauna	Formol
			PUC,inside Track, valley	0-1	25	Meiofauna	Formol
				1-2	25	Meiofauna	Formol
				2-5	25	Meiofauna	Formol
				0-1	31	Meiofauna	Formol
				1-2	31	Meiofauna	Formol
				2-5	31	Meiofauna	Formol
				0-1	32	Meiofauna	Formol
				1-2	32	Meiofauna	Formol
				2-5	32	Meiofauna	Formol
158-1	7/09/2015	S Reference	PUC	0-2	chamber 1	Meiofauna	Formol
			PUC	2-5	chamber 1	Meiofauna	Formol
			20 x 20 cm	NA	chamber 1	Macrofauna	Formol
			PUC	0-2	chamber 2	Meiofauna	Formol
			PUC	2-5	chamber 2	Meiofauna	Formol
			20 x 20 cm	NA	chamber 2	Macrofauna	Formol
			PUC	0-2	chamber 3	Meiofauna	Formol
			PUC	2-5	chamber 3	Meiofauna	Formol
			20 x 20 cm	NA	chamber 3	Macrofauna	Formol
159-1	7/09/2015		PUC	0-2	chamber 1	Meiofauna	Formol
			PUC	2-5	chamber 1	Meiofauna	Formol
			20 x 20 cm	NA	chamber 1	Macrofauna	Formol
			20 x 20 cm	NA	chamber 2	Macrofauna	Formol
			PUC	0-2	chamber 3	Meiofauna	Formol
			PUC	2-5	chamber 3	Meiofauna	Formol
			20 x 20 cm	NA	chamber 3	Macrofauna	Formol
163	5/09/2015	E DEA	PUC,Inside track, on ripple	0-1	35	Meiofauna	Formol
				1-2	35	Meiofauna	Formol
				2-5	35	Meiofauna	Formol
				0-1	53	Meiofauna	Formol
				1-2	53	Meiofauna	Formol
				2-5	53	Meiofauna	Formol
				0-1	46	Meiofauna	Formol
				1-2	46	Meiofauna	Formol
				2-5	46	Meiofauna	Formol

Table 7.11.4 continued. *Overview of the sampled stations*

Station	Date	Area	Description	Slice interval (cm)	Core Id.	Analysis	Fixation
169	7/09/2015	E DEA	PUC,inside Track, valley	0-1	34	Meiofauna	Formol
				1-2	34	Meiofauna	Formol
				2-5	34	Meiofauna	Formol
				0-1	38	Meiofauna	Formol
				1-2	38	Meiofauna	Formol
				2-5	38	Meiofauna	Formol
				0-1	79	Meiofauna	Formol
				1-2	79	Meiofauna	Formol
				2-5	79	Meiofauna	Formol
176	9/09/2015	E DEA	PUC,white spots	0-1	23	Meiofauna	Formol
				1-2	23	Meiofauna	Formol
				2-5	23	Meiofauna	Formol
				0-1	58	Meiofauna	Formol
				1-2	58	Meiofauna	Formol
				2-5	58	Meiofauna	Formol
				0-1	76	Meiofauna	Formol
				1-2	76	Meiofauna	Formol
				2-5	76	Meiofauna	Formol
179	10/10/2015	E DEA	PUC,Outside Track	0-1	81	Meiofauna	Formol
				1-2	81	Meiofauna	Formol
				2-5	81	Meiofauna	Formol
				0-1	67	Meiofauna	Formol
				1-2	67	Meiofauna	Formol
				2-5	67	Meiofauna	Formol
				0-1	60	Meiofauna	Formol
				1-2	60	Meiofauna	Formol
				2-5	60	Meiofauna	Formol
186	14/09/2015	W Reference	PUC	0-2	chamber 1	Meiofauna	Formol
			PUC	2-5	chamber 1	Meiofauna	Formol
			20 x 20 cm	NA	chamber 1	Macrofauna	Formol
			PUC	0-2	chamber 2	Meiofauna	Formol
			PUC	2-5	chamber 2	Meiofauna	Formol
			20 x 20 cm	NA	chamber 2	Macrofauna	Formol
			PUC	0-2	chamber 3	Meiofauna	Formol
			PUC	2-5	chamber 3	Meiofauna	Formol
			20 x 20 cm	NA	chamber 3	Macrofauna	Formol

Table 7.11.5 continued. *Overview of the sampled stations.*

Station	Date	Area	Description	Slice interval (cm)	Core Id.	Analysis	Fixation
187	14/09/2015	SW DEA	PUC	0-2	chamber 1	Meiofauna	Formol
			PUC	2-5	chamber 1	Meiofauna	Formol
			20 x 20 cm	NA	chamber 1	Macrofauna	Formol
			PUC	0-2	chamber 2	Meiofauna	Formol
			PUC	2-5	chamber 2	Meiofauna	Formol
			20 x 20 cm	NA	chamber 2	Macrofauna	Formol
			PUC	0-2	chamber 3	Meiofauna	Formol
			PUC	2-5	chamber 3	Meiofauna	Formol
			20 x 20 cm	NA	chamber 3	Macrofauna	Formol
205-1	18/09/2015	SW DEA, EBS plough track	PUC, white spots	0-1	21	Meiofauna	Formol
				1-2	21	Meiofauna	Formol
				2-5	21	Meiofauna	Formol
				0-1	71	Meiofauna	Formol
				1-2	71	Meiofauna	Formol
				2-5	71	Meiofauna	Formol
				0-1	51	Meiofauna	Formol
				1-2	51	Meiofauna	Formol
				2-5	51	Meiofauna	Formol
			Inside track, rim of track, brown	0-1	36	Meiofauna	Formol
				1-2	36	Meiofauna	Formol
				2-5	36	Meiofauna	Formol
				0-1	48	Meiofauna	Formol
				1-2	48	Meiofauna	Formol
				2-5	48	Meiofauna	Formol
				0-1	68	Meiofauna	Formol
				1-2	68	Meiofauna	Formol
				2-5	68	Meiofauna	Formol
222	24/09/2015	SW DEA, EBS plough track	PUC, ripple valley	0-1	14	Meiofauna	Formol
				1-2	14	Meiofauna	Formol
				2-5	14	Meiofauna	Formol
				0-1	65	Meiofauna	Formol
				1-2	65	Meiofauna	Formol
				2-5	65	Meiofauna	Formol
			PUC, white spots	0-1	62	Meiofauna	Formol
				1-2	62	Meiofauna	Formol
				2-5	62	Meiofauna	Formol
				0-1	83	Meiofauna	Formol
				1-2	83	Meiofauna	Formol
				2-5	83	Meiofauna	Formol
				0-1	40	Meiofauna	Formol
				1-2	40	Meiofauna	Formol
				2-5	40	Meiofauna	Formol

Table 7.11.6 continued. *Overview of the sampled stations.*

Station	Date	Area	Description	Slice interval (cm)	Core Id.	Analysis	Fixation
225	28/09/2015	Central DEA	PUC	0-2	chamber 1	Meiofauna	Formol
			PUC	2-5	chamber 1	Meiofauna	Formol
			20 x 20 cm	NA	chamber 1	Macrofauna	Formol
			PUC	0-2	chamber 2	Meiofauna	Formol
			PUC	2-5	chamber 2	Meiofauna	Formol
			20 x 20 cm	NA	chamber 2	Macrofauna	Formol
			PUC	0-2	chamber 3	Meiofauna	Formol
			PUC	2-5	chamber 3	Meiofauna	Formol
			20 x 20 cm	NA	chamber 3	Macrofauna	Formol
232	27/09/2015	Central DEA	PUC, ripple valley	0-1	65	Meiofauna	Formol
				1-2	65	Meiofauna	Formol
				2-5	65	Meiofauna	Formol
			PUC, ripple crest	0-1	17	Meiofauna	Formol
				1-2	17	Meiofauna	Formol
				2-5	17	Meiofauna	Formol
				0-1	74	Meiofauna	Formol
				1-2	74	Meiofauna	Formol
				2-5	74	Meiofauna	Formol
				0-1	72	Meiofauna	Formol
				1-2	72	Meiofauna	Formol
				2-5	72	Meiofauna	Formol
			PUC, white spot	0-1	56	Meiofauna	Formol
				1-2	56	Meiofauna	Formol
				2-5	56	Meiofauna	Formol
				0-1	82	Meiofauna	Formol
				1-2	82	Meiofauna	Formol
				2-5	82	Meiofauna	Formol

7.12 Foodweb Experiments

D van Oevelen, T Stratmann, A Sweetman

The extraction of manganese nodules will significantly impact deep-sea benthic ecosystems both directly, by disturbing the seafloor, and indirectly, by dispersion of sediment plumes and mining debris. It is however challenging to predict or even quantify mining impacts, because these deep-sea ecosystems are so poorly understood. The revisit of the nodule area in the Peru Basin that was subjected to a large-scale benthic disturbance provides a unique opportunity to investigate whether the trophic interactions in the benthic food web have recovered during the 26 years since the disturbance was induced. This will allow a unique assessment of how an ecosystem of a nodule area is affected by large-scale disturbance and how much time is required to establish a new equilibrium.

In order to quantify the trophic interactions in the benthic food web we have performed *in situ* pulse-chase studies with algae enriched in the stable isotopes ^{13}C and ^{15}N. The use of $^{13}C/^{15}N$ enriched algae allows tracing the assimilation of algal-derived carbon and nitrogen into microbes, most faunal size-classes (meio-, and macrofauna) and into dissolved inorganic carbon (DIC) following respiration. A novelty is that we use the ROV capability together with newly designed incubation chambers to include megafauna in our experimental approach. Deep-sea megafauna is dominated by holothurians, the ‘cows of the deep sea’, and they represent a key component of abyssal food webs.

During the cruise, we combined two experimental approaches to conduct the isotope labeling studies:

- Free-falling lander (POLIRIS, Fig. 7.12.1). The lander contained three benthic chambers that are driven into the sediment after deployment. Subsequently, algae were injected to start the tracer study of 3 days. Syringe samples are taken and each chamber was equipped with an oxygen sensor to measure sediment community oxygen consumption.
- Large in-situ inCUBEactor chambers (CUBEs, Fig. 7.12.2). After a CUBE is placed on the seafloor, the ROV started the incubation program of 4 days. Each CUBE was equipped with an algal injection system, a syringe-sampling rosette, a stirrer and an oxygen sensor. At the end of the incubation period, the ROV displaced the CUBE and sampled the holothurian (if present), takes three pushcores (for microbes and meiofauna) and an MPI-bladecorer (for macrofauna).

Figure 7.12.1. *Photo of the free-falling lander POLIRIS here deployed using a launcher system to allow accurate positioning inside one of the old plough tracks within the DEA.*

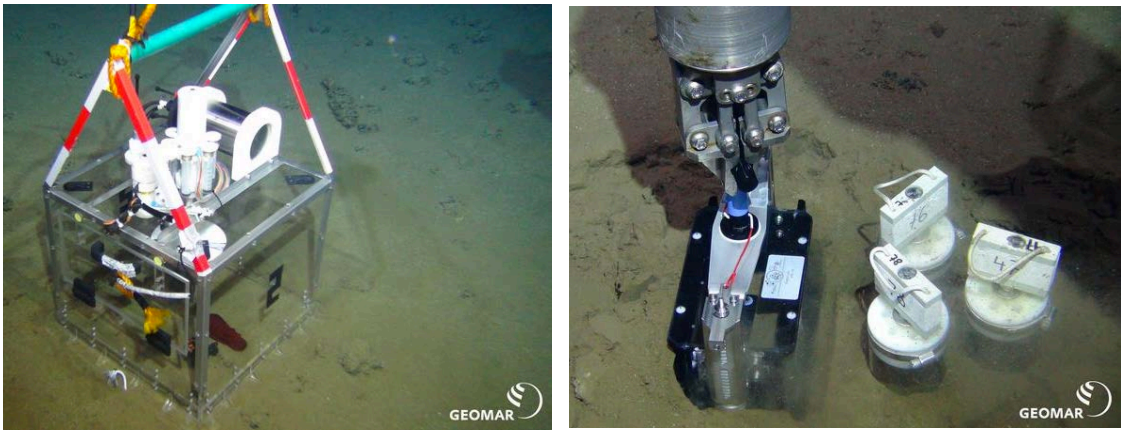

Figure 7.12.2. *Left: Image of CUBE at the seafloor with holothurian caged inside. Right: Image of sampling the sediment surface after CUBE replacement using three pushcores and the MPI-bladecorer.*

The lander POLIRIS and the CUBEs were deployed on old plough tracks in the DEA area and in the Southern reference area (Table 7.12.1).

Table 7.12.1. Overview of isotope labeling food web studies conducted during SO242/2.

Site	In-track	Southern ref area
Without holothurians	2x CUBEs (EBS track site) 1x POLIRIS (Track site 3)	3x POLIRIS
With holothurian	5 CUBEs (3 Track site 1 + 2 Track site 3)	2x CUBEs

To better quantify the role of holothurians in abyssal food webs we used two additional approaches:

- Benthic Incubation Chamber system (BICs) to determine *in situ* respiration rates of holothurians (Fig. 7.12.3). Each chamber is stocked with one holothurian using the slurp gun of the ROV and subsequently closed for a 4-day incubation period during which oxygen concentration is continuously monitored. After recovery on-board, water samples were taken to determine dissolved inorganic carbon and ammonium production. Holothurians were dissected for tissue analysis and when possible, faecal material was collected. An overview of all BICs incubations is shown in Table 7.12.2.
- Tissue analysis of holothurians (Fig. 7.12.4). Holothurian specimens were targeted during ROV dives and sampled using slurp gun. Holothurians were dissected (and when possible faecal material was collected) for tissue analysis. An overview of all holothurian specimens collected is given in Table 7.12.3.

Table 7.12.2. *Overview of BICs incubations*

Deployment site	Content of each BIC
Track 1	BIC 1: Mesothuria BIC 2: Amperima BIC 3: Scotoplanes BIC 4: Blank
Track 2	BIC 1: Synallactes BIC 2: Scotoplanes BIC 3: Psychronaetes BIC 4: Blank
EBS track	BIC 1: Synallactes BIC 2: Synallactes BIC 3: Paeleopatides BIC 4: Blank
Track 3	BIC 1: Benthoturia BIC 2: Peniagone BIC 3: Paeleopatides BIC 4: Paeleopatides

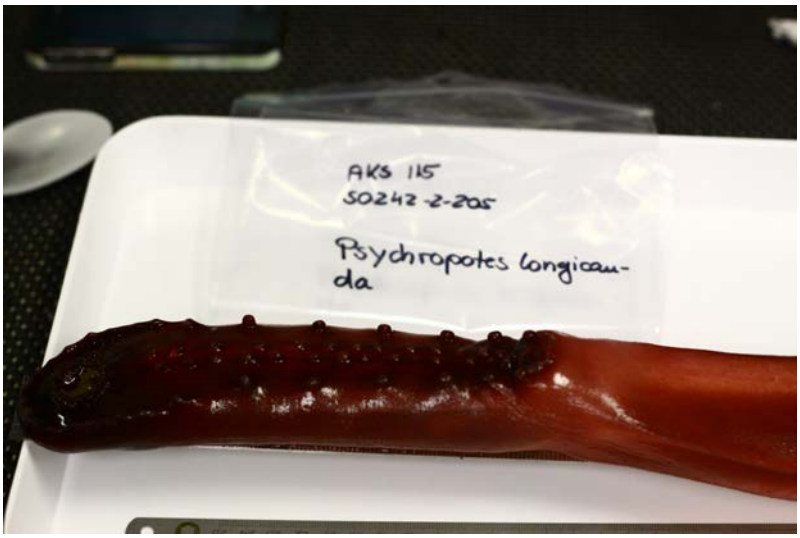

Figure 7.12.4. *Holothurian (Psychropotes longicauda) prior to tissue sample analysis.*

Table 7.12.3. *Overview of collected holothurians used in experimental work.*

Dive	Species collected
D163	3 Scotoplanes 1 Paelopatides 1 Synallactes 1 Deima
D202	1 Psychronaetes
D205	1 Scotoplanes 2 Paelopatides 1 Psychropotes longicauda 1 Amperima 1 Psychronaetes
D211	1 Penagione 1 Paelopatides
D216	1 Scotoplanes 1 Penagione 1 Synallactes
D219	1 unknown species 1 Benthodytes

Table 7.12.4. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
150	Cube	3				x	x						
150	Background			Ekman grab						x			
154	Cube	3				x	x						
156	Lander	1				x	x	x	x	x	x	x	
156	Lander	3				x	x	x	x	x	x	x	
163	Cube	2				x	x						
163	Cube	3				x	x						
163	Suction Pump												Scotoplanes 1
163	Suction Pump												Scotoplanes 2
163	Suction Pump												Scotoplanes 3
163	Suction Pump												Paelopatides 'orange'
163	Suction Pump												Synallactes
163	Suction Pump												Deima
163	Respirometer	4				x	x	x					
163	Respirometer	2				x	x	x					Amperima

Table 7.12.4 continued. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
163	Respirometer	1				x	x	x					Mesothuria
163	Respirometer	3				x	x	x					Scotoplanes
179	Cube	1	61, 55, 49						x		x	x	Scotoplanes3
179	Cube	2	20, 83, 79						x		x	x	Scotoplanes2
179	Cube	3	57, 78.74						x		x	x	Scotoplanes1
179	Backgound sample		74, 24, 10						x		x	x	
179	Cube	3		Bladecore	4					x			
179	Cube	2		Bladecore	3					x			
179	Cube	1		Bladecore	2					x			
179	Backgound sample			Ekman grab	3					x			
166	Cube	1				x	x						Scotoplanes3
166	Cube	2				x	x						Scotoplanes2
166	Cube	3				x	x						Scotoplanes1
180	Lander	1				x	x	x	x	x	x	x	

Table 7.12.4 continued. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
180	Lander	2				x	x	x					
180	Lander	3				x	x	x	x	x	x	x	
196	Cube	2	60, 26, 45						x		x	x	
196	Cube	3	76, 78, 47						x		x	x	
196	Backgound sample		81, 69, 33						x		x	x	
183	Cube	2				x	x						Synallactes
183	Cube	3				x	x						Scotoplanes
196	Cube	2		Bladecorer	1					x			
196	Cube	3		Bladecorer	3					x			
196	Backgound sample			Bladecorer	2					x			
188	Respirometer	1				x	x	x					Synallactes
188	Respirometer	2				x	x	x					Scotoplanes
188	Respirometer	3				x	x	x					Psychronaetes
188	Respirometer	4				x	x	x					
213	Cube	2	67, 20, 53						x		x	x	

Table 7.12.4 continued. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
213	Cube	3	72, 58, 81						x		x	x	
213	Backgound sample		46, 61, 79						x		x	x	
202	Cube	2				x	x						
202	Cube	3				x	x						
213	Cube	2		Bladecorer	1					x			
213	Cube	3		Bladecorer	2					x			
213	Backgound sample			Bladecorer	4					x			
202	Suction Pump												Psychronaetes
202	Respirometer	1				x	x	x					Synallactes_1
202	Respirometer	2				x	x	x					Synallactes_2
202	Respirometer	3				x	x	x					Paeleopatides
202	Respirometer	4				x	x	x					
205	Suction Pump												Scotoplanes
205	Suction Pump												Paeleopatides1
205	Suction Pump												Psychropotes

longicauda

Table 7.12.4 continued. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
205	Suction Pump												Paeleopatides2
205	Suction Pump												Amperima
205	Suction Pump												Psychronaetes
211	Suction Pump												Penagione
211	Suction Pump												Paeleopatides
214	Lander		1			x		x	x	x	x	x	x	
214	Lander		2			x		x	x	x	x	x	x	
214	Lander		3			x		x	x	x	x	x	x	
216	Suction Pump												Scotoplanes
216	Suction Pump												Peniagone
216	Suction Pump												Synallactes?
232	Cube		2	32, 40, 62							x	x	
232	Cube		3	68, 75, 83							x	x	
219	Cube		2			x		x					Scotoplanes

Table 7.12.4 continued. *Sample list.*

station #	Lander/ Cube/ Respirometer/ Background sample/ Suction Pump	# Lander chamber/ Cube/ Respirometer	# PUC	Ekman grab/ bladecore	# Ekman grab/ bladecore	nutrients	DIC	respi-ration	meio-fauna	macro-fauna	bacteria (Roberto Danovaro)	sediment + bacteria	Holothuria_genus
219	Cube	3				x	x						Scotoplanes
232	Cube	2		Bladecorer	3					x			
232	Cube	3		Bladecorer	4					x			
219	Respirometer	1				x	x	x					Benthoturia
219	Respirometer	2				x	x	x					Peniagone
219	Respirometer	3				x	x	x					Paeleopatides
219	Respirometer	4				x	x	x					Paeleopatides
219	Suction Pump												unknown species
219	Suction Pump												Benthodytes
226	Lander	1				x	x	x	x	x	x	x	
226	Lander	2				x	x	x	x	x	x	x	
226	Lander	3				x	x	x	x	x	x	x	

7.13 Ecotoxicology

A Brown, L Mevenkamp, A Sweetman

Introduction

The impacts resulting from extraction of deep-sea minerals remain uncertain, but exposure to elevated concentrations of potentially toxic elements is amongst the potential ensuing stressors: toxic elements may be mobilised by sediment disturbance and resuspension or through *in-situ* disintegration of mineral sources (e.g. polymetallic nodules). Additionally, riser systems used to transport mineral resources to the surface may return extraction waters with elevated concentrations of toxic elements to the deep seafloor. The remoteness of deep-sea ecosystems makes experimental assessment of deep-sea mining impacts challenging, and the urgency to exploit these resources may drive researchers to use shallow-water ecosystems as proxies. Extensive ecotoxicological data available for shallow-water taxa make this an attractive approach, but whether shallow-water taxa are suitable proxies for deep-sea taxa remains unclear: ecologically-driven physiological adaptation in the deep sea may invalidate such an approach by affecting sensitivity to toxicants. The aim of the SO242/2 ecotoxicology experiments was to determine whether the sensitivity of abyssal deep-sea taxa to copper exposure differs from the responses of related shallow-water taxa.

Materials and Methods

Enclosure corrals (Fig. 7.13.1) were used to isolate holothurians or meiofauna. Enclosure corrals were constructed from 10 mm laboratory grade laminate and were 40 cm tall, tapering from 40 × 40 cm to 30 × 30 cm. The top of enclosure corrals for isolating holothurians was covered with nylon mesh (3 × 3 mm) to prevent holothurians escaping: a vent in the covering mesh allowed holothurian corral handling using the ROV manipulator. Enclosure corrals for meiofauna were not covered. Enclosure corrals were transported to the seafloor by elevator and were deployed using the ROV Kiel 6000.

Six meiofauna enclosure corrals were deployed: enclosure corrals were pressed 10 cm into undisturbed abyssal sediment and were either untreated (control), or treated with artificial sediment (sediment effect) or artificial sediment spiked with copper (copper effect; 4 copper concentrations). Artificial sediment was incubated at 2°C in filtered seawater (sediment effect) or in filtered seawater spiked with copper (copper effect; 1, 5, 10, or 20 mg Cu l^{-1}) for 72 h prior to deployment: samples of artificial sediment were taken for determination of copper concentration. Corrals were sampled after approximately 96 h: three push cores were taken from each corral. Push cores were recovered and sliced at the artificial sediment horizon, and the underlying 1 cm, 2 cm and 5 cm deep-sea sediment depth horizons, for meiofaunal community analysis. A subsample (5 ml) was taken from each sediment sample and preserved at -20°C to determine final metal concentrations. Sediment samples were preserved in 4% formalin.

One holothurian enclosure corral was lost during the elevator descent and subsequently only eight holothurian enclosure corrals were deployed. Six corrals were deployed with *Scotoplanes* sp.: two with no sediment addition, two with addition

of artificial sediment, and two with addition of artificial sediment spiked with copper (incubated as described above with 5 mg Cu l^{-1}). Three additional *Scotoplanes* sp. specimens were sampled to examine the corral effect. Two corrals were deployed with *Benthodytes* sp.: one with addition of artificial sediment, and one with addition of artificial sediment spiked with copper (incubated as described above with 5 mg Cu l^{-1}). Holothurian species identification was based on morphological characteristics and will be supported by molecular phylogenetic comparison using both mitochondrial and nuclear DNA markers (DNA barcoding) where possible. Corrals were sampled after approximately 96 h: the holothurian was sampled using ROV suction pump, and 2 push cores were taken from each corral. Holothurians were recovered, dissected, snap frozen in liquid nitrogen and preserved at -80°C for enzymatic and transcriptomic analyses. Push cores were processed as described above.

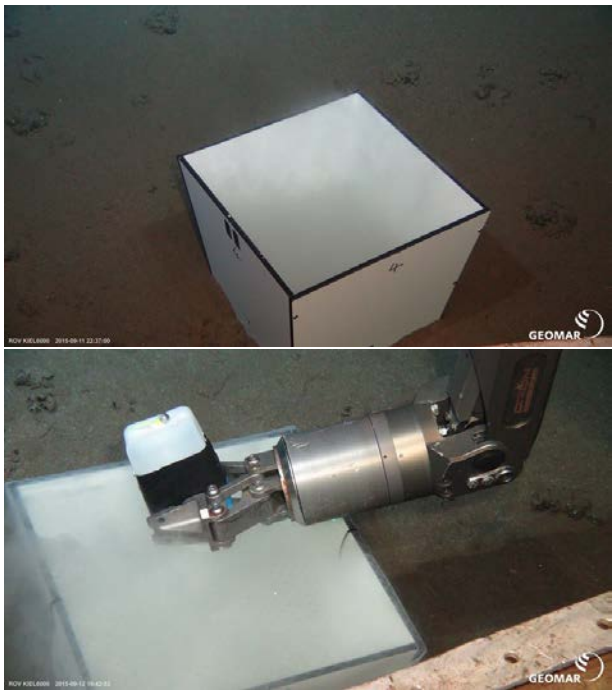

Figure 7.13.1. (**A**) Deployed meiofauna corral immediately following sediment dispensation, and (**B**) deployed holothurian corral during sediment dispensation.

Baited traps were used to attract lysianassoid amphipods. Traps were constructed from plexiglas cylinders: one end was covered in fine mesh (2 × 2 mm) to allow bait odour diffusion and scavenger attraction, and the other end was fitted with a funnel projecting into the cylinder to allow scavengers entry to the trap whilst preventing exit. Two trap sizes were used in each deployment: small (cylinder length 40 cm, cylinder ø 10 cm, funnel aperture ø 10 mm) and large (cylinder length 35 cm, cylinder ø 15 cm, funnel aperture ø 15 mm). ~250 g of unprocessed mackerel (control) or unprocessed mackerel spiked with copper (copper effect) were used as bait. Mackerel was spiked with copper by incubation at 2°C in filtered seawater with 25, 50, 75, or 100 mg Cu l^{-1} for 24 h prior to deployment. Traps were deployed on a lander (~2.5 m above the seafloor) or on an elevator (~1.5 m above the seafloor). Traps were recovered after ~36 h and 30 amphipods were snap frozen in liquid nitrogen and preserved at -80°C for enzymatic and transcriptomic analyses. Remaining amphipods were preserved in 4% formalin.

Table 7.13.1. *Ecotoxicological samples.*

Experiment	Treatment	Push cores	Megafauna samples
Meiofauna corrals	No sediment	SO242/2_D196_PUC52 SO242/2_D196_PUC65 SO242/2_D196_PUC63	
	Artificial sediment	SO242/2_D196_PUC9 SO242/2_D196_PUC58 SO242/2_D196_PUC80	
	Artificial sediment spiked with [Cu][1]	SO242/2_D196_PUC20 SO242/2_D196_PUC57 SO242/2_D196_PUC74	
	Artificial sediment spiked with [Cu][2]	SO242/2_D196_PUC24 SO242/2_D196_PUC49 SO242/2_D196_PUC83	
	Artificial sediment spiked with [Cu][3]	SO242/2_D196_PUC10 SO242/2_D196_PUC61 SO242/2_D196_PUC67	
	Artificial sediment spiked with [Cu][4]	SO242/2_D196_PUC79 SO242/2_D196_PUC53 SO242/2_D196_PUC18	
	Background	SO242/2_D216_PUC35 SO242/2_D216_PUC40 SO242/2_D216_PUC69	

Table 7.13.1 continued. *Ecotoxicological samples.*

Experiment	Treatment	Push cores	Megafauna samples
Holothurian corrals	No sediment	SO242/2_D198_PUC21 SO242/2_D198_PUC5 SO242/2_D198_PUC73 SO242/2_D198_PUC31	SO242/2_D188_EXP-Holocorral#6-holothuria SO242/2_D188_EXP-Holocorral#8-holothuria
	Artificial sediment	SO242/2_D198_PUC37 SO242/2_D198_PUC51 SO242/2_D198_PUC68 SO242/2_D198_PUC55 SO242/2_D198_PUC3 SO242/2_D198_PUC59	SO242/2_D188_EXP-Holocorral#2-holothuria SO242/2_D188_EXP-Holocorral#3-holothuria SO242/2_D188_EXP-Holocorral#5-holothuria
	Artificial sediment spiked with [Cu][1]	SO242/2_D198_PUC32 SO242/2_D198_PUC71 SO242/2_D198_PUC34 SO242/2_D198_PUC36 SO242/2_D198_PUC48 SO242/2_D198_PUC35	SO242/2_D188_EXP-Holocorral#1-holothuria SO242/2_D188_EXP-Holocorral#4-holothuria SO242/2_D188_EXP-Holocorral#7-holothuria
	Background	SO242/2_D216_PUC35 SO242/2_D216_PUC40 SO242/2_D216_PUC69	SO242/2_D205_EXP-Background-holothuria1 SO242/2_D205_EXP-Background-holothuria2 SO242/2_D205_EXP-Background-holothuria3

Table 7.13.1 continued. *Ecotoxicological samples.*

Experiment	Treatment	Push cores	Megafauna samples
Baited traps	Bait		SO242/2_156_EXP-Trap-amphipoda
	Bait spiked with [Cu][1]		SO242/2_175_EXP-Trap-amphipoda
	Bait spiked with [Cu][2]		SO242/2_182_EXP-Trap-amphipoda
	Bait spiked with [Cu][3]		SO242/2_200_EXP-Trap-amphipoda
	Bait spiked with [Cu][4]		SO242/2_228_EXP-Trap-amphipoda

7.14 Sedimentation experiments

L Mevencamp

Aim and set-up

With the *in-situ* sediment deposition experiment we aim to gain knowledge about the impact of sediment deposition and more particularly the effect of crushed nodule substrate on meiofaunal abundance and vertical community structure. Similar to an *ex-situ* mine tailings addition experiment conducted earlier the incubation time was set at 11 days to increase comparability of these two experiments.

For this purpose the ROV was used to push six steel rings into the sediment with 5 cm sticking out of the sediment (Fig. 7.14.1). Subsequently, on three of these steel rings a sediment dispenser was deployed to distribute 250 mL of crushed nodule substrate onto the ring surface area. The sediment dispensers were left on the steel rings for one night to allow settlement of the particles. The experimental site was set up in the southern reference area of the DEA on 22.09.2015.

Table 7.14.7. *Number of push cores derived from the sediment deposition experiment*

Sample Code	Station #	PUC #	ID	Analysis
SO242/2_D216_PUC25	216	25	SD1	Meiofauna
SO242/2_D216_PUC37	216	37	SD2	Meiofauna
SO242/2_D216_PUC34	216	34	SD3	Meiofauna
SO242/2_D216_PUC13	216	13	C1	Meiofauna
SO242/2_D216_PUC5	216	5	C2	Meiofauna
SO242/2_D216_PUC12	216	12	C3	Meiofauna
SO242/2_D216_PUC47	216	47	SD1	Abiotic factors
SO242/2_D216_PUC32	216	32	SD2	Abiotic factors
SO242/2_D216_PUC14	216	14	SD3	Abiotic factors
SO242/2_D216_PUC83	216	83	C1	Abiotic factors
SO242/2_D216_PUC22	216	22	C2	Abiotic factors

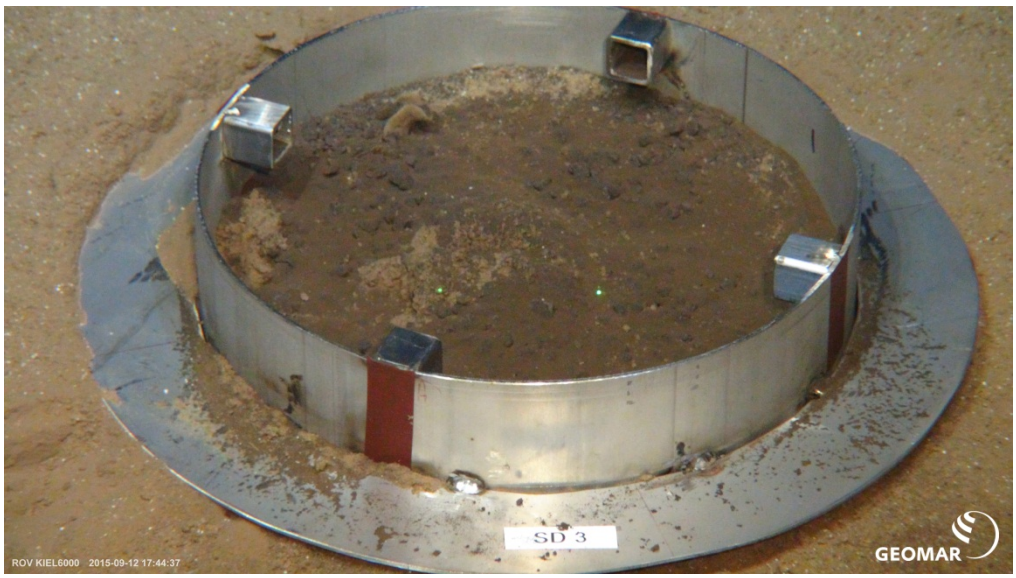

Figure 7.14.1. *Set up of one treatment experimental core at the start of the incubation period.*

Sampling

After the incubation time of eleven days each steel ring was subsampled with two push cores. After removal and sampling of the added sediment layer, the push cores were sliced in 0-1 cm,1-2 cm and 2-5 cm intervals. Of each slice from each core a small subsample (5 mL) was taken to measure metal concentrations in the sediment. Of each set of push cores, one was used for meiofauna community analysis and slices were fixed in 4% buffered formalin while the other core was subsampled for analysis of sediment characteristics. Sediment characteristics include a sample for grain size determination and organic matter content and are stored at -20°C and one sample for pigment analysis (only 0-1cm layer) which is stored at -80°C. The samples will be analysed at Ghent University.

7.15 Plume experiments

A Bleyer, S Bohsung, M. Haeckel, K Hamann, S Paul

7.15.1 Introduction

In order to analyze a sediment plume in the lower water column above the seafloor and to assess possible impacts on the deep-sea environment, a small sediment plume was created with the ROV ‘Kiel 6000’ of GEOMAR. This experiment, despite being of a rather small spatial and temporal scale, serves to simulate the anticipated much larger and potentially more persistent sediment plumes that will be created in the course of future industrial mining of polymetallic nodules. The goal of our experiment is to get insights into how long the particles stay in suspension, to detect changes in bottom water oxygen concentrations as well as to assess if contaminant levels (e.g. toxic metals) increase.

Three experiments of this kind were carried out in the course of the SO242/2 cruise, with various time intervals of plume sampling after the disturbance was created. Filters with particle samples will be analyzed on-shore for trace metals. Water samples were analyzed on board for their content of nutrients (see Chapter 7.7 “Geochemical Analyses”). Additionally, subsamples for DOC, Mn speciation, trace elements – including REY – (JUB) as well as dissolved cations (ICP-AES), anions (IC), and inorganic carbon (DIC) (GEOMAR) were taken for further shore-based analysis. See Table 7.15.1 for a complete list.

7.15.2 Plume sampling

A plume was created by whirling up oxic and suboxic sediment with the ROV. This was achieved by touching down the ROV once or twice onto the seafloor. The sediment patches chosen for the experiments were two plough tracks from 1989 and the side pile of a fresh EBS track towed on 14 August 2015 during SO242/1 (85 EBS 4; see Cruise Report SO242/1, Chapter 8.2). In the plough marks and especially in the relatively fresh EBS track, the opportunity exists to release the suboxic sediment into the plume as well because much of the upper fluffy layer has already been removed during the DISCOL plowing and EBS tow. After creating the plume, the ROV lifted from the seafloor and drifted with the bottom current, thereby trying to stay in the sediment plume. Water and suspended sediment in the plume were sampled with three Niskin bottles attached to the ROV porch. The Niskin bottles were closed at different times during the experiment (Table 7.15.1).

Onboard water samples from the Niskin bottles were filtered through 0.2µm or 0.8µm cellulose acetate filters. Subsequently, subsamples for Mn(II/III) speciation, DOC and trace element including REYs were taken. Samples for Mn(II/III) speciation were immediately frozen at -20°C while the subsamples for DOC and trace element analyses were acidified to pH 2 with HCl and kept refrigerated (JUB). The filters were dried at 40°C in the oven and then kept refrigerated. They will be analyzed for the solid phase trace element and REY concentrations that were released with the

plume. This will be done by pressure digestion and subsequent analyses with ICP-OES and ICP-MS.

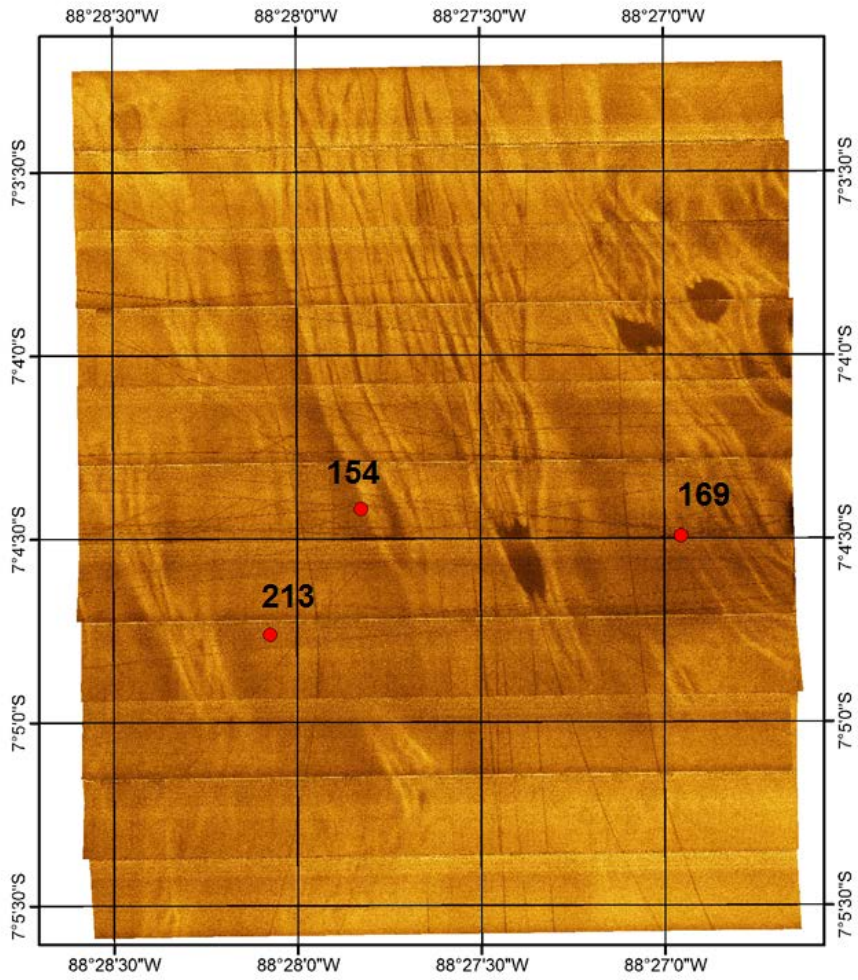

Figure 7.15.2. *AUV sidescan sonar map of the DEA showing the locations of the three sediment plume experiments (station no. 154, 169, 213) carried out and sampled with the ROV.*

7.15.3 Preliminary Results

First differences in turbidity can be seen already by looking at the water taken with the Niskin bottles (Figures 7.15.2 and 7.15.3).

Figure 7.15.3. *SO242/2_154_ROVniskin. From the right: four bottles with water taken after 1 minute, four bottles with water taken after 4 minutes, and four bottles with water taken after 9 minutes of plume creation.*

Figure 7.15.4. *SO242/2_169_ROVniskin. From the right: three bottles with water taken after 8 minutes, three bottles with water taken after 27 minutes, four bottles with water taken after 45 minutes of plume creation.*

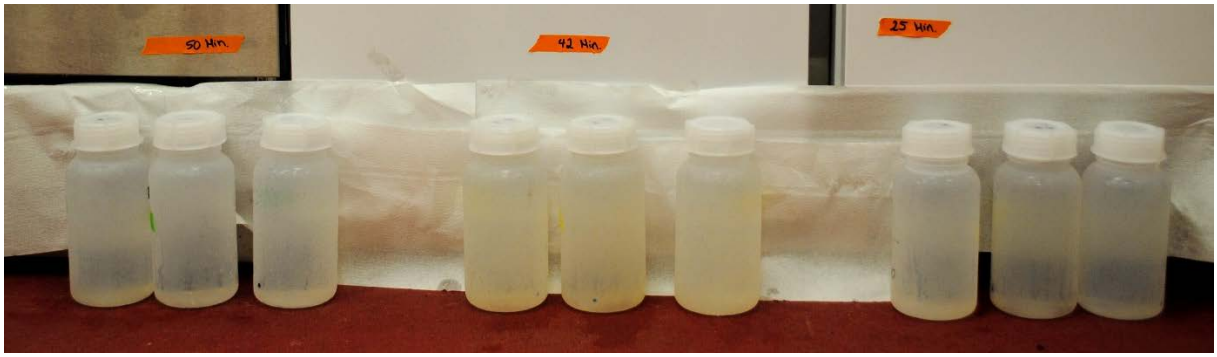

Figure 7.15.5. *SO242/2_213_ROVniskin. From the right: three bottles with water taken after 25 minutes, three bottles with water taken after 42 minutes, three bottles of water taken after 50 minutes of plume creation.*

Onboard analyses for dissolved seawater components (total alkalinity, iron, phosphate, ammonium, nitrate, nitrite, silicate) did not show any significant effect, i.e. concentrations stayed constant during the experiment and matched the typical ambient bottom water values that were measured in CTD, MUC, PUC, and control ROV-NISKIN samples.

In addition to the discrete plume sampling with Niskin bottles, a MAPR sensor (see section 7.2) was mounted on all ROV dives, measuring the turbidity in the water column. The data clearly show the created sediment plume and the slow settling of particles. A cloud of finely dispersed particles that was visibly difficult to identify, however, persisted also after the end of the experiment. During the 3rd experiment (213 ROV) three oxygen optodes were mounted to the ROV to attempt measuring possible O_2 consumption by oxidation of reduced sediments being whirled up. A preliminary look at this data did not reveal a significant decrease in oxygen concentrations – a thorough analysis of the data after the cruise is, however, necessary to come to a sound and verified conclusion.

Table 7.15.1. *List of sediment plume samples and collected subsamples*

Station Device	Area		UTC time	Lat (S)	Lon (W)	Water depth (m)	Volume filtered (mL)	CA Filters	DOC	Mn (II/III)	Trace metals	IC, ICP-AES, DIC
154_ROV	DEA Disturbance West	Start	23:30:17	7:4.4160	88:27.8273	4139						
		NIS 1	23:31:40	7:4.4144	88:27.8272	4140	840/1125	2	X	X	X	X
		NIS 2	23:34:35	7:4.4157	88:27.8248	4140	1740	1	X	X	X	X
		NIS 3	23:39:18	7:4.4255	88:27.8208	4140	1530	1	X	X	X	X
		End										
169_ROV	DEA Disturbance East	Start	20:38:08	7:4.4884	88:26.9593	4143						
		NIS 1	20:47:11	7:4.4930	88:26.9667	4143	1320	1	X	X	X	X
		NIS 2	21:06:00	7:4.4939	88:26.9715	4143	1550	1	X	X	X	X
		NIS 3	21:24:31	7:4.4922	88:26.9703	4126	2100	1	X	X	X	X
		End										
213_ROV	EBS Track	Start	18:15:42	-7:4.7596	-88:28.0736	4140						
		NIS 1	18:40:24	-7:4.7796	-88:28.0892	4140	1720	1	X	X	X	X
		NIS 2	18:57:37	-7:4.7842	-88:28.0950	4140	2620	1	X	X	X	X
		NIS 3	19:05:48	-7:4.7851	-88:28.1010	4140	2880	1	X	X	X	X
		End										

7.16 ROBEX Crawler ‘Tramper’

J Lemburg, F Wenzhöfer

During the cruise the new developed autonomous benthic crawler “Tramper” was deployed to test its performance at the seafloor. The crawler was build within the HGF Alliance ROBEX – Robotic Exploration in Extreme Environments (http://www.robex-allianz.de/) and consists of caterpillar drives, synthetic foam, a battery, two electronic cylinders, a ballast release system and its scientific payload. The scientific payload comprises of a high-resolution photo camera and a microprofiler revolver system to perform high-resolution oxygen microprofiles across the sediment water interface. The revolver system carries three individual revolvers with 8 oxygen optodes each. A launcher is used to deploy (Fig. 7.16.1) the crawler at the seafloor, which also enables a precise positing at targeted sites. At the seafloor the autonomous operation starts and the crawler repeats a preprogrammed cycle. After its initial waiting period the crawler starts its routine: moving 10 m at a speed of 5 m/min, taking a photo of the area to measure (Fig. 7.16.2), start the oxygen microprofiling, take a photo at the end of the oxygen measurement, and wait for a given time (for this cruise 5 min). For the oxygen profile measurement one sensor from each revolver magazine is moved stepwise into the sediment. During this expedition we performed three in situ test to get information’s on: deploying Tramper with the Launcher, its approach of the seafloor, how does it move over the seafloor, and how does it perform during ascent (Tab 7.16.1). During Trampers first deployment we had the special opportunity to observe the release and landing with the ROV Kiel6000 waiting on the spot**.** At the seafloor we performed several cycles of movements to investigate the driving behaviour on soft sediments. The video observation showed that the caterpillar tracks do not get stuck in the soft sediment and the disturbance is minimized to the small tracks Tramper creates during its movement.

Table 7.16.1. *Deployments of the Crawler Tramper*

Station	date	Position	Water depth (m)
242-2_170-1	07.09.2015 18:06:11	7:04.522 S 88:26.91 W	4142
242-2_178-1	10.09.2015 11:57:33	7:07.469 S 88:26.884 W	4142
242-2_215-1	22.09.2015 13:08:00	7:07.532 S 88:27.041 W	4126

Figure 7.16.1. *Tramper deployment with Launcher (Photo: Johannes Lemburg)*

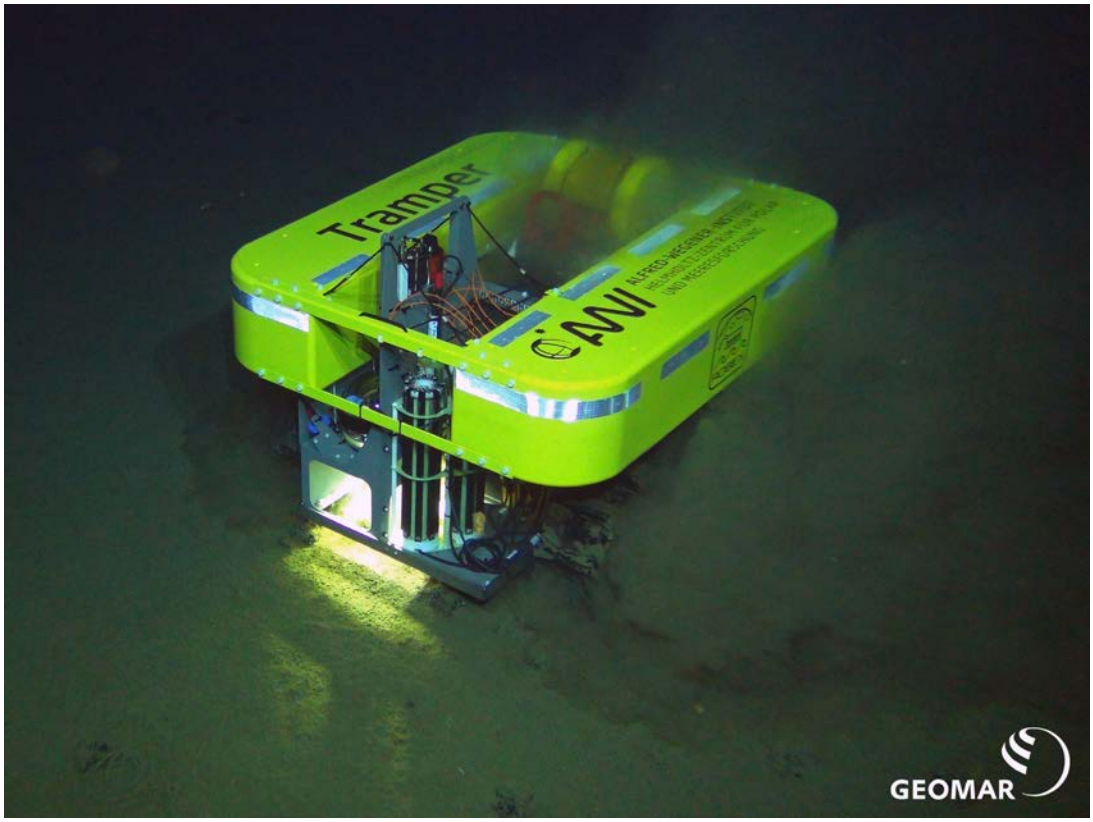

Figure 7.16.2. *Tramper at the seafloor taking a picture of the seafloor spot where the oxygen profiling will be performed (Photo: ROV Kiel6000, Geomar)*

8. Acknowledgements / Danksagung

We thank captain and crew of SO242/2 for their excellent support with work at sea, and the Control Station German Research Vessels Hamburg for help with expedition preparations and logistics. This expedition contributes to the project JPIO Pilot Action “Ecological aspects of deep-sea mining” and was funded by the BMBF (03F0707A-G). We acknowledge further financial support from the Helmholtz Association (Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Bremerhaven), the Max Planck Society; NWO (Netherlands Organisation for Scientific Research / Nederlandse Organisatie voor Wetenschappelijk Onderzoek) grant 856.14.002; the Portuguese Science Foundation FCT (IF/00029/2014/CP1230/CT0002). The research has also received funding from the European Union Seventh Framework Programme (FP7/2007- 2013) under the MIDAS project, grant agreement n∞ 603418.

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10. Abbreviations / Abkürzungen

AODC	Acridine Orange Direct Count
ATESEPP	Auswirkungen Technischer Eingriffe in Das Ökosystem Der Tiefsee Im Sued-Ost-Pazifik Vor Peru (Impacts of potential deep-sea ecosystem in the southeast Pacific)
AUV	Autonomous Underwater Vehicle
BIC	Benthic Incubation Chamber
CA	Cellulose Acetate
CTD	Conductivity, Temperature, Depth probe
DIC	Dissolved Inorganic Carbon
DISCOL	DISturbance and reCOLonization experiment
DEA	DISCOL Experimental Area
DOC	Dissolved Organic Carbon
DOU	Diffusive Oxygen Uptake
EBS	Epi-Benthic Sled
EEA	Extracellular Enzymatic Activity
EEZ	Exclusive Economic Zone
FACS	Fluorescence Assisted Cell-Sorting
FLNTU	Fluorescence / Turbidity
FISH	Fluorescence In Situ Hybridisation
GF/F	Glass Microfiber Filter
GFRP	Glass Fiber Reinforced Plastic
IAPSO	International Association for the Physical Sciences of the Oceans
ICP-AES	Inductively-Coupled Atomic Emission Spectroscopy
ICP-OES	Inductively-Coupled Plasma Optical Emission Spectrometry
ISCHAM	Nodule Respiration CHAMBER
JPIO	Joint Programming Initiative Healthy and Productive Seas and Oceans
MAPR	Miniature Autonomous Plume Recorder
MUC	Multiple Core(r)
OFOP	Ocean Floor Observation Protocol
OFOS	Ocean Floor Observing System
OMZ	Oxygen Minimum Zone
ORP	Oxygen Reduction Potential
OSCA	Ocean Support Carriage Application
PHF	Primary High Frequency
POC	Particulate Organic Carbon
PUC	Push Core
ROBEX	Robotic Exploration of Extreme Environments
ROV	Remote Operated Vehicle
SLF	Secondary Low Frequency
TOC	Total Organic Carbon
TOU	Total Oxygen Uptake
USBL	Ultra Short Base Line

11. Appendices / Anhänge

11.A Participating Institutions / Liste der teilnehemden Institutionen

Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Bremerhaven, DE | AWI

Christian-Albrechts-University, Kiel, DE | CAU Kiel

FIELAX Gesellschaft für wissenschaftliche Datenverarbeitung mbH, Bremerhaven, DE | FIELAX

GEOMAR Helmholtz Centre for Ocean Research Kiel, DE | GEOMAR

International Research Institute of Stavanger, Randaberg, NO | IRIS

iSiTEC GmbH, Bremerhaven, DE | iSiTEC

Jacobs University Bremen GmbH, Bremen, DE | JUB

Manfred Schulz TV & Film Produktion, Asendorf, DE | Manfred Schulz TV & Film

Max-Planck-Institute for Marine Microbiology, Bremen, DE | MPI

Norwegian University of Science and Technology, Trondheim, NO | NTNU

Royal Netherlands Institute for Sea Research, Yerseke, NL | NIOZ

Gent University, Gent, BE | UGent

University of Southampton, Southampton, UK | USOU

11.B Station List / Stationsliste

Table 11.B.1. *Station list for SO242-2 cruise.*

Over the next pages the full station list, detailing where and when every core, sample and measurement was made, is given.

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2-track	Underway cruise track measurements	2015-08-28T00:00	-2.27996	79.91038		2015-10-01T00:00	-2.28	79.91038		
SO242/2_137-1	ParaSound	2015-08-29T22:21	-4.83985	-84.863	4054	2015-08-30T17:10	-7.0652	-88.46652	4140	Action: station start/station end; Position sensor: Ship-mounted DGPS; Comment: Station 137
SO242/2_137	ParaSound	2015-08-30T15:00	-6.70421	-88.2697		2015-08-30T17:12	-7.0691	-88.46535		
SO242/2_138-1	CTD/Rosette	2015-08-30T19:30	-7.07363	-88.4643	-4141					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4119 m
SO242/2_139-1	Ocean Floor Observation System	2015-08-31T03:34	-7.13062	-88.4502	4121	2015-08-31T05:35	-7.1101	-88.45462	3791	Action: max depth/on ground; Position sensor: USBL
SO242/2_140	ParaSound	2015-08-31T07:15	-7.10579	-88.4537		2015-08-31T10:33	-7.0755	-88.45026		
SO242/2_140-1	ParaSound	2015-08-31T07:52	-7.02557	-88.4755	4052	2015-08-31T10:28	-7.0764	-88.4513	4150	Action: station start/station end; Position sensor: Ship-mounted DGPS; Comment: Station # 140, rwK: 225Â°, d: 4nm
SO242/2_141-1	Boomerang-Lot	2015-08-31T11:30	-7.07685	-88.4508	4148	2015-09-03T08:47	-7.0769	-88.4508	4148	Action: in the water; Position sensor: USBL; Comment: Chamber & Profiler-Lander 1 (AWI/MPI)
SO242/2_142-1	Remote operated vehicle	2015-08-31T14:55	-7.07405	-88.4648	4129	2015-08-31T21:05	-7.0735	-88.46394	4131	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_142_BFC-ROV-3	Benthic flux chamber	2015-08-31T16:03	-7.0735	-88.4639	4139	2015-08-31T20:57	-7.0735	-88.46389	4139	Action: on ground/max depth; Position sensor: USBL; Comment: Chamber 3 on ripples of plough track area #1, program does not start, chamber sinks to deep
SO242/2_142_PUC-18	Push corer	2015-08-31T16:40	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 1; PC diameter = 7.4 cm
SO242/2_142_PUC-46	Push corer	2015-08-31T16:40	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 1; PC diameter = 7.4 cm
SO242/2_142_PUC-23	Push corer	2015-08-31T16:40	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 1; PC diameter = 7.4 cm
SO242/2_142_PUC-33	Push corer	2015-08-31T16:40	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 1; PC diameter = 7.4 cm
SO242/2_142_PUC-34	Push corer	2015-08-31T16:40	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 1; PC diameter = 7.4 cm
SO242/2_142_PUC-12	Push corer	2015-08-31T16:41	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 2; PC diameter = 7.4 cm
SO242/2_142_PUC-14	Push corer	2015-08-31T16:41	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 2; PC diameter = 7.4 cm
SO242/2_142_PUC-53	Push corer	2015-08-31T16:41	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 2; PC diameter = 7.4 cm
SO242/2_142_PUC-55	Push corer	2015-08-31T16:41	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 2; PC diameter = 7.4 cm
SO242/2_142_PUC-24	Push corer	2015-08-31T16:41	-7.0735	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: Push core taken on top of ripple 2; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_142_PUC-80	Push corer	2015-08-31T17:25	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Push core in trough between ripples 1 + 2; PC diameter = 7.4 cm
SO242/2_142_PUC-47	Push corer	2015-08-31T17:25	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Push core in track without dark sediment cover; PC diameter = 7.4 cm
SO242/2_142_PUC-48	Push corer	2015-08-31T17:25	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Push core in track without dark sediment cover (repeat); PC diameter = 7.4 cm
SO242/2_142_PUC-13	Push corer	2015-08-31T17:25	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores in track without dark sediment cover (disturbed during deployment); PC diameter = 7.4 cm
SO242/2_142_PUC-9	Push corer	2015-08-31T17:25	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Push core in track without dark sediment cover; PC diameter = 7.4 cm
SO242/2_142_MRK-1	Marker	2015-08-31T17:38	-7.07352	-88.4635	4141					Action: on ground/max depth; Position sensor: USBL; Comment: Marker 1 for the disturbance in track with light colored patches
SO242/2_142_MRK-2	Marker	2015-08-31T17:49	-7.07345	-88.4633	4142					Action: on ground/max depth; Position sensor: USBL; Comment: Marker 2 between 2 tracks directly after crossing for maximum resettled sediment on top of unploughed
SO242/2_142_NET-1-holothurian-1	Net	2015-08-31T19:08	-7.07263	-88.464	4141					Action: on ground/max depth; Position sensor: USBL; Comment: handnet operation (holothurian 1 = Paelaeopatides sp)
SO242/2_142_SLURP-1-holothurian-2	Slurp Gun	2015-08-31T19:35	-7.07287	-88.4634	4143					Action: on ground/max depth; Position sensor: USBL; Comment: sample purple holothurian (Suction pump holothurian 2 = Scotoplanes sp.)
SO242/2_143-1	Ocean Floor Observation System	2015-09-01T00:47	-7.05422	-88.4895	4186	2015-09-01T04:00	-7.0821	-88.45466	4157	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length 4199m
SO242/2_144-1	Boomerang-Lot	2015-09-01T06:34	-7.07383	-88.4637	4130	2015-09-01T07:25	-7.0738	-88.46372	4130	Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Test, max. Cable Length: 500m
SO242/2_145-1	Remote operated vehicle elevator	2015-09-01T10:41	-7.07422	-88.4635	4134					Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: released
SO242/2_146-1	Remote operated vehicle	2015-09-01T15:10	-7.07365	-88.4642	4130	2015-09-02T02:11	-7.0741	-88.46367	4126	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_146_BFC-ROV-3	Benthic flux chamber	2015-09-01T15:56	-7.0735	-88.4638	4139	2015-09-03T17:56	-7.0735	-88.46384	4139	Action: on ground/max depth; Position sensor: USBL; Comment: ROV chamber 3 of MPI/AWI
SO242/2_146_MICP-1-1	Microsensor profiler	2015-09-01T16:57	-7.07349	-88.4639	4139	2015-09-01T20:04	-7.0735	-88.46394	4139	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D146_MICP1-1 (ROV profiler 1 of MPI/AWI, first measurement) (until 01.09.2015 20:04:00)
SO242/2_146_PUC-28	Push corer	2015-09-01T17:05	-7.07349	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC28; PC diameter = 7.4 cm
SO242/2_146_MICP-2-1	Microsensor profiler	2015-09-01T17:48	-7.07333	-88.4638	4140	2015-09-01T21:37	-7.0733	-88.46379	4140	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D146_MICP2-1 (ROV profiler 2 of MPI/AWI, first measurement) (until 01.09.2015 21:37:41)
SO242/2_146_BFC-ROV-2	Benthic flux chamber	2015-09-01T18:44	-7.07333	-88.4638	4140	2015-09-03T18:44	-7.0733	-88.46379	4140	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D146_BFC2 (ROV chamber 2 of MPI/AWI)
SO242/2_146_PUC-62	Push corer	2015-09-01T19:11	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC62; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_146_PUC-56	Push corer	2015-09-01T19:12	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC56; PC diameter = 7.4 cm
SO242/2_146_PUC-73	Push corer	2015-09-01T19:13	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC73 (short core); PC diameter = 7.4 cm
SO242/2_146_PUC-49	Push corer	2015-09-01T19:15	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC49, some sediments from core outside went into core container in ROV drawer; PC diameter = 7.4 cm
SO242/2_146_PUC-59	Push corer	2015-09-01T19:16	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC59; PC diameter = 7.4 cm
SO242/2_146_PUC-82	Push corer	2015-09-01T19:18	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC82; PC diameter = 7.4 cm
SO242/2_146_PUC-50	Push corer	2015-09-01T19:18	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC50; PC diameter = 7.4 cm
SO242/2_146_PUC-76	Push corer	2015-09-01T19:20	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC76 (relatively short); PC diameter = 7.4 cm
SO242/2_146_PUC-79	Push corer	2015-09-01T19:21	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC79; PC diameter = 7.4 cm
SO242/2_146_PUC-74	Push corer	2015-09-01T19:22	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC74; PC diameter = 7.4 cm
SO242/2_146_PUC-83	Push corer	2015-09-01T19:23	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC83; PC diameter = 7.4 cm
SO242/2_146_PUC-57	Push corer	2015-09-01T19:40	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC57; PC diameter = 7.4 cm
SO242/2_146_PUC-66	Push corer	2015-09-01T19:47	-7.07333	-88.4638	4140					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC66; PC diameter = 7.4 cm
SO242/2_146_MICP-1-2	Microsensor profiler	2015-09-01T20:31	-7.07349	-88.4639	4139	2015-09-02T00:01	-7.0735	-88.46394	4139	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D146_MICP_1-2 (ROV profiler 1 of MPI/AWI, second measurement)
SO242/2_146_PUC-58	Push corer	2015-09-01T20:59	-7.07349	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC58; PC diameter = 7.4 cm
SO242/2_146_PUC-77	Push corer	2015-09-01T21:02	-7.07349	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_PUC77; PC diameter = 7.4 cm
SO242/2_146_NIS-1	Bottle, Niskin 5-L	2015-09-01T21:07	-7.07349	-88.4639	4139					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D146_NIS1 (ROV Niskin bottle) closed in track near PUC58 and PUC77
SO242/2_146_MICP-2-2	Microsensor profiler	2015-09-01T21:45	-7.07333	-88.4638	4141	2015-09-02T18:45	-7.0733	-88.46379	4141	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D146_MICP_2-2 (ROV profiler 2 of MPI/AWI, second measurement)
SO242/2_146_MICP-1-3	Microsensor profiler	2015-09-02T00:12	-7.07348	-88.4642	4138	2015-09-02T13:12	-7.0735	-88.46416	4138	Action: on ground/max depth; Position sensor: USBL; Comment: vertical panorama of profiler 1 on sediment (1 of 3)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_147-1	MultiCorer	2015-09-02T04:51	-7.10097	-88.4139	4198					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4226m
SO242/2_148-1	MultiCorer	2015-09-02T08:35	-7.10088	-88.4138	4196					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4233m , SZmax: 54,7kN
SO242/2_149-1	CTD/Rosette	2015-09-02T12:14	-7.09912	-88.4229	-4196					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length. 1497 m
SO242/2_150-1	Remote operated vehicle	2015-09-02T15:22	-7.07367	-88.4642	4079	2015-09-03T00:12	-7.0742	-88.4637	4088	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_150_BFC-ROV-1-1	Benthic flux chamber	2015-09-02T16:13	-7.07353	-88.4634	4101	2015-09-04T00:13	-7.0735	-88.46341	4101	Action: on ground/max depth; Position sensor: USBL; Comment: placement of chamber 1 on whitish spot #2 (chamber 1 penetrates approx. 5 cm into the sediment, 10cm ring visible)
SO242/2_150_BFC-CUBE-3-1	Benthic flux chamber	2015-09-02T16:56	-7.07445	-88.4636	4100	2015-09-02T17:01	-7.0745	-88.46359	4100	Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 3 on track #1 (test how deep cube sinks into sediment)
SO242/2_150_BFC-CUBE-3-2	Benthic flux chamber	2015-09-02T17:31	-7.07433	-88.4634	4101	2015-09-02T21:42	-7.0743	-88.46338	4101	Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 3 placed over purple holothurian off track #2
SO242/2_150_PUC-12	Push corer	2015-09-02T18:55	-7.07341	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 12, 33, 34 at undisturbed site #1; PC diameter = 7.4 cm
SO242/2_150_PUC-33	Push corer	2015-09-02T18:55	-7.07341	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 12, 33, 34 at undisturbed site #1; PC diameter = 7.4 cm
SO242/2_150_PUC-34	Push corer	2015-09-02T18:55	-7.07341	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 12, 33, 34 at undisturbed site #1; PC diameter = 7.4 cm
SO242/2_150_PUC-48	Push corer	2015-09-02T19:57	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 14, 48, 55 on ripple top #1; PC diameter = 7.4 cm
SO242/2_150_PUC-14	Push corer	2015-09-02T19:57	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 14, 48, 55 on ripple top #1; PC diameter = 7.4 cm
SO242/2_150_PUC-55	Push corer	2015-09-02T19:57	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 14, 48, 55 on ripple top #1; PC diameter = 7.4 cm
SO242/2_150_PUC-13	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm
SO242/2_150_PUC-18	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm
SO242/2_150_PUC-23	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm
SO242/2_150_PUC-24	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm
SO242/2_150_PUC-46	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm
SO242/2_150_PUC-53	Push corer	2015-09-02T20:24	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_150_PUC-9	Push corer	2015-09-02T20:45	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 45, 47, 9, 80 in ripple valley #2; PC diameter = 7.4 cm
SO242/2_150_PUC-45	Push corer	2015-09-02T20:45	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 45, 47, 9, 80 in ripple valley #2; PC diameter = 7.4 cm
SO242/2_150_PUC-47	Push corer	2015-09-02T20:45	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 45, 47, 9, 80 in ripple valley #2; PC diameter = 7.4 cm
SO242/2_150_PUC-80	Push corer	2015-09-02T20:45	-7.07354	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PUC 45, 47, 9, 80 in ripple valley #2; PC diameter = 7.4 cm
SO242/2_150_NIS-1	Bottle, Niskin 5-L	2015-09-02T20:57	-7.07407	-88.4638	4098					Action: on ground/max depth; Position sensor: USBL; Comment: water sample with Niskin bottle taken
SO242/2_150_EG-3-holothurian-1	Ekman grab	2015-09-02T21:39	-7.07433	-88.4634	4102					Action: on ground/max depth; Position sensor: USBL; Comment: holothurian trapped in Ekman grab 3; EG dimensions: lengh=20 cm, width=20 cm; height=20 cm
SO242/2_150_EXP-CORRAL-1	Benthic Mesocosm Experiment	2015-09-02T22:24	-7.07412	-88.4636	4102	2015-09-02T22:26	-7.0741	-88.46355	4102	Action: on ground/max depth; Position sensor: USBL; Comment: pushing corral into sediment
SO242/2_151-1	MultiCorer	2015-09-03T03:32	-7.10055	-88.4139	4198					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4230m
SO242/2_152-1	CTD/Rosette	2015-09-03T06:20	-7.07575	-88.4505	-4140					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 1495 m
SO242/2_153-1	Remote operated vehicle elevator	2015-09-03T12:02	-7.0739	-88.4637	4135					Action: hoisting; Position sensor: USBL; Comment: released
SO242/2_154-1	Remote operated vehicle	2015-09-03T15:11	-7.07405	-88.4637	4091	2015-09-04T01:50	-7.074	-88.46378	4090	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_154_BFC-CUBE	Benthic flux chamber	2015-09-03T15:19	-7.07396	-88.4637	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of CUBE (BFC) experiment injection syringe
SO242/2_154_MICP-1-1	Microsensor profiler	2015-09-03T15:50	-7.07353	-88.4636	4100	2015-09-03T19:23	-7.0735	-88.46362	4100	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 1-1 (MICP 1-1) start successfully (until 03.09.2015 19:23:13)
SO242/2_154_MICP-2-1	Microsensor profiler	2015-09-03T16:26	-7.07353	-88.4636	4100	2015-09-03T19:18	-7.0735	-88.46362	4100	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 2-1 (MICP 2-1) placed on top of the whittish spots (until 03.09.2015 19:18:54)
SO242/2_154_PUC-71	Push corer	2015-09-03T16:46	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 71, on white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-83	Push corer	2015-09-03T16:47	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 83, on top of the white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-62	Push corer	2015-09-03T16:49	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 62, on top of white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-57	Push corer	2015-09-03T16:52	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 57, on top of the whitish spot; PC diameter = 7.4 cm
SO242/2_154_PUC-82	Push corer	2015-09-03T16:54	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 82, on top of the whitish spot; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_154_PUC-59	Push corer	2015-09-03T16:55	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 59, on top of the white spots; PC diameter = 7.4 cm
SO242/2_154_PUC-49	Push corer	2015-09-03T16:57	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 49, on top of the whitish spot; PC diameter = 7.4 cm
SO242/2_154_PUC-76	Push corer	2015-09-03T16:59	-7.07351	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 76, on top of the whitish spots; PC diameter = 7.4 cm
SO242/2_154_PUC-77	Push corer	2015-09-03T17:25	-7.07349	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 77 placed on white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-73	Push corer	2015-09-03T17:26	-7.07349	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 73 placed on white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-58	Push corer	2015-09-03T17:28	-7.07349	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 58 placed on white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-50	Push corer	2015-09-03T17:30	-7.07349	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 50 on white spot; PC diameter = 7.4 cm
SO242/2_154_PUC-79	Push corer	2015-09-03T17:32	-7.07349	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 79 placed on white spot; PC diameter = 7.4 cm
SO242/2_154_ISCHAM-BICS-3-1	In situ incubation chamber	2015-09-03T17:52	-7.07348	-88.4639	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Taking chamber 3-1 (ISCHAM 3-1)
SO242/2_154_PUC-74	Push corer	2015-09-03T18:40	-7.07335	-88.4638	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Photo from PUC 74 being placed; PC diameter = 7.4 cm
SO242/2_154_ISCHAM-BICS-2-1	In situ incubation chamber	2015-09-03T18:43	-7.07335	-88.4638	4099					Action: on ground/max depth; Position sensor: USBL; Comment: take chamber 2-1 (ISCHAM 2-1)
SO242/2_154_MICP-2-2	Microsensor profiler	2015-09-03T19:18	-7.07353	-88.4636	4100	2015-09-03T22:18	-7.0735	-88.46362	4100	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 2-2 (MICP 2-2) switched on
SO242/2_154_MICP-1-2	Microsensor profiler	2015-09-03T19:23	-7.07353	-88.4636	4100	2015-09-03T21:05	-7.0735	-88.46362	4100	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 1-2 (MICP 1-2) could not be switched on
SO242/2_154_PUC-56	Push corer	2015-09-03T19:31	-7.07353	-88.4636	4101					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 56 placed on whitish spot; PC diameter = 7.4 cm
SO242/2_154_PUC-38	Push corer	2015-09-03T20:00	-7.07354	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 38 placed on valley; PC diameter = 7.4 cm
SO242/2_154_PUC-20	Push corer	2015-09-03T20:03	-7.07354	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 20 placed on ripple crest; PC diameter = 7.4 cm
SO242/2_154_PUC-25	Push corer	2015-09-03T20:10	-7.07352	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 25 into sediment, valley; PC diameter = 7.4 cm
SO242/2_154_PUC-35	Push corer	2015-09-03T20:18	-7.07352	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 35 placed on crest; PC diameter = 7.4 cm
SO242/2_154_PUC-31	Push corer	2015-09-03T20:19	-7.07352	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 31 placed on valley; PC diameter = 7.4 cm
SO242/2_154_PUC-32	Push corer	2015-09-03T20:22	-7.07352	-88.464	4098					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 32 placed on valley, relatively short core; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_154_SLURP-1-ophiurod-1	Slurp Gun	2015-09-03T23:06	-7.07377	-88.4638	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Ophiuroid 1 collected
SO242/2_154_NIS-1	Bottle, Niskin 5-L	2015-09-03T23:31	-7.07359	-88.4638	4099					Action: on ground/max depth; Position sensor: USBL; Comment: sample left Niskin 1-1 (NIS 1-1)
SO242/2_154_NIS-2	Bottle, Niskin 5-L	2015-09-03T23:34	-7.07359	-88.4638	4099					Action: on ground/max depth; Position sensor: USBL; Comment: take middle Niskin 2-1 (NIS 2-1)
SO242/2_154_NIS-3	Bottle, Niskin 5-L	2015-09-03T23:39	-7.07376	-88.4637	4100					Action: on ground/max depth; Position sensor: USBL; Comment: taken right Niskin 3-1 (NIS 3-1)
SO242/2_154_ISCHAM-BICS-1-1	In situ incubation chamber	2015-09-03T23:50	-7.07357	-88.4635	4100					Action: on ground/max depth; Position sensor: USBL; Comment: chamber 1-1 (ISCHAM 1-1) pick up
SO242/2_155-1	Ocean Floor Observation System	2015-09-04T04:27	-7.0751	-88.4792	4129	2015-09-04T10:38	-7.0725	-88.45403	4144	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4142m
SO242/2_157-1	CTD/Rosette	2015-09-04T14:57	-7.07363	-88.4642	-4133					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Cable Length: 4116 m
SO242/2_160-1	Ocean Floor Observation System	2015-09-05T00:01	-7.06752	-88.4544	4142	2015-09-05T00:53	-7.0662	-88.4516	3947	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length 4154m
SO242/2_161	ParaSound	2015-09-05T02:47	-7.06423	-88.4541		2015-09-05T09:30	-7.0745	-88.45063		
SO242/2_161-1	ParaSound	2015-09-05T03:17	-7.00107	-88.447	4064	2015-09-05T08:27	-7.0668	-88.4443	4169	Action: station start/station end; Position sensor: Ship-mounted DGPS
SO242/2_162-1	Remote operated vehicle elevator	2015-09-05T11:28	-7.0743	-88.4507	4134					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Cable Length 4131m, released
SO242/2_163-1	Remote operated vehicle	2015-09-05T15:09	-7.07438	-88.4503	4085	2015-09-05T23:37	-7.0742	-88.45083	4085	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_163_PV-1	Photo/Video	2015-09-05T15:53	-7.07488	-88.4489	4104	2015-09-05T15:58	-7.0749	-88.4489	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (unitl 05.09.2015 15:58:24)
SO242/2_163_BFC-ROV-3	Benthic flux chamber	2015-09-05T15:56	-7.07488	-88.4489	4104	2015-09-06T22:56	-7.0749	-88.4489	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Chamber 3 placed. check for penetration depth
SO242/2_163_PV-2	Photo/Video	2015-09-05T16:07	-7.07488	-88.4489	4104	2015-09-05T16:20	-7.0749	-88.4489	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (unitl 05.09.2015 16:20:51)
SO242/2_163_PUC-24	Push corer	2015-09-05T16:12	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: start pushcoring PC24 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-35	Push corer	2015-09-05T16:13	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc35 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-13	Push corer	2015-09-05T16:14	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc13 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-20	Push corer	2015-09-05T16:14	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc20 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-18	Push corer	2015-09-05T16:16	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc18 (ripples disturbed track); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_163_PUC-48	Push corer	2015-09-05T16:17	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc48 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-38	Push corer	2015-09-05T16:19	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc38 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-53	Push corer	2015-09-05T16:20	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc53 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-79	Push corer	2015-09-05T16:23	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc 79 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-55	Push corer	2015-09-05T16:23	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc55 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-9	Push corer	2015-09-05T16:25	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc9 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-33	Push corer	2015-09-05T16:26	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc33 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-74	Push corer	2015-09-05T16:27	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc74 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-46	Push corer	2015-09-05T16:28	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc46 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PUC-80	Push corer	2015-09-05T16:29	-7.07488	-88.4489	4104					Action: on ground/max depth; Position sensor: USBL; Comment: pc80 (ripples disturbed track); PC diameter = 7.4 cm
SO242/2_163_PV-3	Photo/Video	2015-09-05T17:09	-7.07419	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: BICs on elevator2
SO242/2_163_ISCHAM-BICS-4	In situ incubation chamber	2015-09-05T17:18	-7.07419	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: respirometer 4 closed
SO242/2_163_SLURP-1-holothurian-1	Slurp Gun	2015-09-05T17:33	-7.07412	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes in slurp gun
SO242/2_163_ISCHAM-BICS-2-holothurian-1	In situ incubation chamber	2015-09-05T17:39	-7.07419	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Released Scotoplanes in BIC2
SO242/2_163_SLURP-2-holothurian-2	Slurp Gun	2015-09-05T18:12	-7.07395	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes slurped, but probably damaged, will be brought up in slurp gun chamber
SO242/2_163_SLURP-3-holothurian-3	Slurp Gun	2015-09-05T18:22	-7.07388	-88.4509	4097					Action: on ground/max depth; Position sensor: USBL; Comment: Mesothuria in slurp gun, return to elevator
SO242/2_163_ISCHAM-BICS-1-holothurian-2	In situ incubation chamber	2015-09-05T18:29	-7.07419	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Mesothuria in BIC1
SO242/2_163_PV-4	Photo/Video	2015-09-05T18:33	-7.07419	-88.4509	4098	2015-09-05T18:34	-7.0742	-88.45086	4098	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 05.09.2015 18:34:59)
SO242/2_163_SLURP-4-holothurian-4	Slurp Gun	2015-09-05T18:45	-7.07407	-88.4508	4097					Action: on ground/max depth; Position sensor: USBL; Comment: Slurped up Scotoplanes carefully, return to respirometer
SO242/2_163_PV-5	Photo/Video	2015-09-05T18:50	-7.07419	-88.4509	4098	2015-09-05T18:59	-7.0742	-88.45086	4098	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 05.09.2015 18:59:49)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_163_ISCHAM-BICS-3-holothurian-3	In situ incubation chamber	2015-09-05T18:56	-7.07419	-88.4509	4098					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes in BIC3 and lid of chamber secured
SO242/2_163_SLURP-5-holothurian-5	Slurp Gun	2015-09-05T19:26	-7.0738	-88.4507	4097					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes broke and is stored inchambers 2+3
SO242/2_163_SLURP-6-holothurian-6	Slurp Gun	2015-09-05T19:26	-7.0738	-88.4507	4097					Action: on ground/max depth; Position sensor: USBL; Comment: New Scotoplanes slurped
SO242/2_163_SLURP-7-holothurian-7	Slurp Gun	2015-09-05T19:35	-7.07371	-88.4506	4097					Action: on ground/max depth; Position sensor: USBL; Comment: Holothurian (probably) slurped into chamber 5
SO242/2_163_SLURP-8-holothurian-8	Slurp Gun	2015-09-05T19:54	-7.07368	-88.4505	4097					Action: on ground/max depth; Position sensor: USBL; Comment: Scynelactus slurped into chamber 6
SO242/2_163_SLURP-9-holothurian-9	Slurp Gun	2015-09-05T20:39	-7.07437	-88.4513	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Deima is stuck in slurpgun
SO242/2_163_SCOOP-1-Nodule-1	Scoop/Biobox	2015-09-05T21:03	-7.07428	-88.451	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Nodule picked up and stored in drawer
SO242/2_164-1	Ocean Floor Observation System	2015-09-06T01:19	-7.06627	-88.4519	4149	2015-09-06T06:50	-7.0507	-88.43275	4101	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length: 4160m
SO242/2_166-1	Remote operated vehicle	2015-09-06T15:00	-7.07455	-88.4508	4099	2015-09-07T01:09	-7.0747	-88.44893	4102	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_166_BFC-CUBE-3-holothurian-1	Benthic flux chamber	2015-09-06T15:19	-7.07452	-88.4508	4100	2015-09-10T21:42	-7.0745	-88.45078	4100	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of CUBE 3 (BFC). Infront of CUBE 3 (BFC) there is a salp and an Ophiuroid
SO242/2_166_MICP-1-1	Microsensor profiler	2015-09-06T16:03	-7.07485	-88.449	4103	2015-09-06T19:27	-7.0749	-88.44896	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of profiler 1 (MICP) placed on seafloor
SO242/2_166_MICP-2-1	Microsensor profiler	2015-09-06T16:37	-7.07485	-88.449	4103	2015-09-06T23:05	-7.0749	-88.44896	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 2 (SO242-2_D166_MICP-Profiler2) is placed on seafloor at disturbed area and its motor started to turn
SO242/2_166_PV-1	Photo/Video	2015-09-06T16:45	-7.07404	-88.4491	4099					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of Elevator (ROV_E) with postcard for Uni Kiel
SO242/2_166_BFC-ROV-1	Benthic flux chamber	2015-09-06T16:57	-7.07438	-88.4489	4101	2015-09-07T23:57	-7.0744	-88.44885	4101	Action: on ground/max depth; Position sensor: USBL; Comment: Close up photo of place for Chamber 1 (BFC), patch without nodules was selected for chamber 1 (BFC) deployment
SO242/2_166_BFC-ROV-2	Benthic flux chamber	2015-09-06T17:44	-7.07483	-88.4488	4104	2015-09-07T21:44	-7.0748	-88.44881	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of chamber 2 (SO242-2_D166_BFC-Chamber2) on seafloor. penetration between second and third yellow ring (counted from the top)
SO242/2_166_PUC-28	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 28 is marked because it will be used for pore water extraction with rhizones; PC diameter = 7.4 cm
SO242/2_166_PUC-50	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 50 disturbed while putting back into drawer; PC diameter = 7.4 cm
SO242/2_166_PUC-56	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 56 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-58	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 58 taken; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_166_PUC-59	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 59 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-62	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 62 contains a very dark brown patch at bottom of core. its the same core that went into sediment not so easily; PC diameter = 7.4 cm
SO242/2_166_PUC-64	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 64 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-66	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 66 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-68	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 28 is marked because it will be used for pore water extraction with rhizones; PC diameter = 7.4 cm
SO242/2_166_PUC-70	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 70 an 77 are slightly tilted. ; PC diameter = 7.4 cm
SO242/2_166_PUC-72	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 72 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-73	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 73 is fragmented/broken in upper layer; PC diameter = 7.4 cm
SO242/2_166_PUC-75	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 75 taken; PC diameter = 7.4 cm
SO242/2_166_PUC-77	Push corer	2015-09-06T18:21	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 70 an 77 are slightly tilted. ; PC diameter = 7.4 cm
SO242/2_166_PUC-63	Push corer	2015-09-06T19:19	-7.07462	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 63 ripple valley; PC diameter = 7.4 cm
SO242/2_166_PUC-69	Push corer	2015-09-06T19:19	-7.07462	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 69 ripple valley; PC diameter = 7.4 cm
SO242/2_166_Marker-1	Marker	2015-09-06T19:25	-7.07462	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: placing a marker ripple valley 166
SO242/2_166_BFC-CUBE-2-holothurian-2	Benthic flux chamber	2015-09-06T21:32	-7.0746	-88.4489	4101	2015-09-10T17:32	-7.0746	-88.44888	4101	Action: on ground/max depth; Position sensor: USBL; Comment: start button of cube 2 (SO242-2_D166_BFC-CUBE#2) was triggered. Experiment started
SO242/2_166_BFC-CUBE-1-holothurian-3	Benthic flux chamber	2015-09-06T22:05	-7.07435	-88.4509	4099	2015-09-10T19:58	-7.0744	-88.4509	4099	Action: on ground/max depth; Position sensor: USBL; Comment: photos of cube 1 (SO242-2_D166_BFC-CUBE#1-scotoplanes) with Scotoplanes
SO242/2_167-1	CTD/Rosette	2015-09-07T02:39	-7.1251	-88.4505	-3912					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Cable Length: 610 m
SO242/2_158-1	Boomerang-Lot	2015-09-07T04:40	-7.12425	-88.4497	4045	2015-09-07T09:47	-7.1243	-88.44967	4045	Action: hoisting; Position sensor: USBL; Comment: Chamber & Profiler-Lander 1 (AWI/MPI)
SO242/2_168	ParaSound	2015-09-07T06:17	-7.12474	-88.4497		2015-09-07T13:10	-7.0721	-88.44856		
SO242/2_159-1	Boomerang-Lot	2015-09-07T07:57	-7.09985	-88.413	4144	2015-09-07T09:47	-7.0999	-88.41297	4144	Action: hoisting; Position sensor: USBL; Comment: Chamber & Profiler-Lander 2 (AWI/MPI)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_168-1	ParaSound	2015-09-07T09:57	-7.10052	-88.4149	4196	2015-09-07T13:07	-7.0747	-88.4488	4133	Action: station start/station end; Position sensor: Ship-mounted DGPS; Comment: 090Â° rW
SO242/2_169-1	Remote operated vehicle	2015-09-07T15:21	-7.07453	-88.4486	4099	2015-09-08T02:14	-7.0745	-88.44878	4035	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_169_MICP-1-1	Microsensor profiler	2015-09-07T15:51	-7.07427	-88.4486	4102	2015-09-07T18:45	-7.0743	-88.44863	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 1 started with Magnetic stick: SO242-2_D169_MICP1-1 (deployment of Profiler 1 in undisturbed area until 07.09.2015 18:45:46)
SO242/2_169_MICP-2-1	Microsensor profiler	2015-09-07T16:22	-7.07464	-88.4487	4104	2015-09-07T18:58	-7.0746	-88.44867	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 2 started with Magnetic stick: SO242-2_D169_MICP2-1 (deployed in track above ripple crest until 07.09.2015 18:59:02)
SO242/2_169_PUC-13	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 13 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-18	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 18 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-20	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 20 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-24	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 24 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-33	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 33 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-34	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 34 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-38	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 38 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-49	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 49 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-55	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 55 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-57	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 57 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-67	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 67 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-79	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 79 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_PUC-9	Push corer	2015-09-07T17:14	-7.07465	-88.4486	4104					Action: on ground/max depth; Position sensor: USBL; Comment: PUC 9 in ripple valley; PC diameter = 7.4 cm
SO242/2_169_BCRAWL	Benthic Crawler	2015-09-07T17:55	-7.07525	-88.4487	4084					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of approaching Crawler (SO242-2_170-1_BCRAWL) from distance
SO242/2_170-1	Benthic Crawler	2015-09-07T18:06	-7.07537	-88.4485	4142					Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length: 4156m
SO242/2_169_MICP-1-2	Microsensor profiler	2015-09-07T18:51	-7.07427	-88.4486	4101	2015-09-07T22:39	-7.0743	-88.44863	4101	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 1 started successfully: SO242-1_D169_MICP1-2

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_169_MICP-2-2	Microsensor profiler	2015-09-07T19:17	-7.0747	-88.4485	4103	2015-09-07T23:05	-7.0747	-88.4485	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 2 place in new position and started: SO242-2_D169_MICP2-2 (on ripple crest)
SO242/2_169_PUC-10	Push corer	2015-09-07T19:48	-7.07467	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores for geochemistry taken in white patch: SO242-2_D169_PUCxx (x = 10,83); PC diameter = 7.4 cm
SO242/2_169_PUC-83	Push corer	2015-09-07T19:48	-7.07467	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores for geochemistry taken in white patch: SO242-2_D169_PUCxx (x = 10,83); PC diameter = 7.4 cm
SO242/2_169_NIS-1	Bottle, Niskin 5-L	2015-09-07T20:47	-7.07489	-88.4495	4102					Action: on ground/max depth; Position sensor: USBL; Comment: left Niskin is closed inside plume (0.3 m above seafloor): SO242-2_D169_NIS1
SO242/2_169_NIS-2	Bottle, Niskin 5-L	2015-09-07T21:06	-7.07491	-88.4495	4102					Action: on ground/max depth; Position sensor: USBL; Comment: middle Niskin is closed inside plume (0.8 m above seafloor): SO242-2_D169_NIS2
SO242/2_169_NIS-3	Bottle, Niskin 5-L	2015-09-07T21:24	-7.07487	-88.4495	4100					Action: on ground/max depth; Position sensor: USBL; Comment: right Niskin is closed inside plume (0.5m above seafloor): SO242-2_D169_NIS3
SO242/2_169_PV-1	Photo/Video	2015-09-07T21:35	-7.07477	-88.4493	4090	2015-09-07T21:37	-7.0748	-88.44926	4090	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. on to film swimming octopus (until 07.09.2015 21:37:07)
SO242/2_165-1	Remote operated vehicle elevator	2015-09-08T01:55	-7.074	-88.449	4035					Action: hoisting; Position sensor: USBL; Comment: released
SO242/2_171-1	Ocean Floor Observation System	2015-09-08T06:10	-7.07327	-88.4707	4136	2015-09-08T13:13	-7.0738	-88.44744	4081	Action: max depth/on ground; Position sensor: USBL; Comment: Cable Length: 4144m
SO242/2_156-1	Boomerang-Lot	2015-09-08T13:51	-7.12905	-88.4518	4158	2015-09-08T15:04	-7.1291	-88.4518	4158	Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: Deep Sea Oberservatory System (DOS)-Lander (GEOMAR)
SO242/2_172-1	CTD/Rosette	2015-09-08T17:58	-7.07467	-88.4488	-4131					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4127 m
SO242/2_173	ParaSound	2015-09-08T22:48	-7.07477	-88.4484		2015-09-08T03:30	-7.0746	-88.44989		
SO242/2_173-1	ParaSound	2015-09-08T23:00	-7.06745	-88.455	4135	2015-09-09T00:33	-7.0717	-88.45438	4139	Action: station start; Position sensor: Ship-mounted DGPS
SO242/2_174-1	Ocean Floor Observation System	2015-09-09T02:07	-7.07295	-88.4577	4155	2015-09-09T08:23	-7.0936	-88.44138	4151	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length: 4167m
SO242/2_175-1	Remote operated vehicle elevator	2015-09-09T12:07	-7.07427	-88.449	4118					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Bottom Sight, Cable Length 4153m
SO242/2_176-1	Remote operated vehicle	2015-09-09T15:11	-7.07463	-88.4487	4100	2015-09-10T00:53	-7.0741	-88.44863	4088	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_176_BFC-ROV-3	Benthic flux chamber	2015-09-09T15:34	-7.0746	-88.4487	4102	2015-09-11T01:34	-7.0746	-88.44865	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Start Chamber 3 (MPI/AWI) on white spot; So241_2_176_BFC3
SO242/2_176_PV-1	Photo/Video	2015-09-09T15:34	-7.0746	-88.4487	4103	2015-09-09T15:44	-7.0746	-88.44865	4101	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 09.09.2015 15:44:44)
SO242/2_176_MICP-1-1	Microsensor profiler	2015-09-09T15:41	-7.0746	-88.4487	4103	2015-09-09T17:59	-7.0746	-88.44865	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Start Profiler 1 (MPI/AWI) white spot; So242_2_176_MICP1-1 (on white spot edge between ripples)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_176_MICP-2-1	Microsensor profiler	2015-09-09T16:09	-7.07446	-88.4486	4102	2015-09-09T18:27	-7.0745	-88.44864	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Start Profiler 2 (MPI/AWI) undisturbed; So242_2_176_MICP2-1 (placed on seafloor; position about 5 meters from track)
SO242/2_176_BFC-ROV-1	Benthic flux chamber	2015-09-09T16:34	-7.07446	-88.4486	4102	2015-09-11T00:34	-7.0745	-88.44864	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Start Chamber 1 (MPI/AWI) on undisturbed area; So242_2_176_BFC 1
SO242/2_176_PV-2	Photo/Video	2015-09-09T16:36	-7.07446	-88.4486	4102	2015-09-09T16:39	-7.0746	-88.44866	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 09.09.2015_16:39:47
SO242/2_176_PV-3	Photo/Video	2015-09-09T16:52	-7.07431	-88.4487	4102	2015-09-09T16:52	-7.0743	-88.44868	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 09.09.2015_16:52:13)
SO242/2_176_SCOOP-1-nodule-1	Scoop/Biobox	2015-09-09T16:54	-7.07431	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: Nodule sampled
SO242/2_176_ISCHAM-Nodule-1	In situ incubation chamber	2015-09-09T17:08	-7.07424	-88.449	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Start Knolle (MPI/AWI) Nodule in chamber; So242_2_176_knolle1
SO242/2_176_SCOOP-2-nodule-2	Scoop/Biobox	2015-09-09T17:17	-7.07429	-88.4489	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photos of selected nodule with sponge
SO242/2_176_ISCHAM-Nodule-2	In situ incubation chamber	2015-09-09T17:41	-7.07424	-88.449	4101					Action: on ground/max depth; Position sensor: USBL; Comment: Start Knolle (MPI/AWI) Nodule with sponge and worm; So242_2_176_knolle2
SO242/2_176_MICP-1-2	Microsensor profiler	2015-09-09T18:06	-7.07446	-88.4486	4103	2015-09-09T21:42	-7.0745	-88.44864	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Start second Profiler 1 (MPI/AWI) measurement in undisturbed arae; So242_2_176_MIC1-2
SO242/2_176_MICP-2-2	Microsensor profiler	2015-09-09T18:41	-7.07467	-88.4485	4104	2015-09-09T21:23	-7.0747	-88.44848	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Start second Profiler 2 (MPI/AWI) measurement on white sediment patch; profiler slightly tilted; So242_2_176_MICP2-2
SO242/2_176_SCOOP-3-nodule-3	Scoop/Biobox	2015-09-09T18:55	-7.07436	-88.4487	4102					Action: on ground/max depth; Position sensor: USBL; Comment: nodule with a white sponge on top. we will scoop it and bring it to the incubaction chamber
SO242/2_176_ISCHAM-Nodule-3	In situ incubation chamber	2015-09-09T19:36	-7.07424	-88.449	4101					Action: on ground/max depth; Position sensor: USBL; Comment: Start Knolle nodule + sponge; So242_2_176_knolle3
SO242/2_176_PUC-23	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 35, 38, 70, 76, 23 (at flank of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-35	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 35, 38, 70, 76, 23 (at flank of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-38	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 35, 38, 70, 76, 23 (at flank of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-50	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 75, 50, 58, 56 (at flank of white hill); PC diameter = 7.4 cm
SO242/2_176_PUC-56	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 75, 50, 58, 56 (at flank of white hill); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_176_PUC-58	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 75, 50, 58, 56 (at flank of white hill); PC diameter = 7.4 cm
SO242/2_176_PUC-59	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 59, 77, 68, 72 (direct on top of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-68	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 59, 77, 68, 72 (direct on top of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-70	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 35, 38, 70, 76, 23 (at flank of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-72	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 59, 77, 68, 72 (direct on top of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-73	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 73 (at flank of white bump); PC diameter = 7.4 cm
SO242/2_176_PUC-75	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 75, 50, 58, 56 (at flank of white hill); PC diameter = 7.4 cm
SO242/2_176_PUC-76	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 35, 38, 70, 76, 23 (at flank of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-77	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 59, 77, 68, 72 (direct on top of white spot); PC diameter = 7.4 cm
SO242/2_176_PUC-82	Push corer	2015-09-09T20:49	-7.07466	-88.4485	4104					Action: on ground/max depth; Position sensor: USBL; Comment: Push cores at white spot: 82 (at disturbed flank of white bump); PC diameter = 7.4 cm
SO242/2_176_MICP-2-3	Microsensor profiler	2015-09-09T21:35	-7.07469	-88.4484	4103	2015-09-10T15:35	-7.0747	-88.44842	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Start third Profiler 2 (MPI/AWI) measurement on white spot; So242_2_176_MICP2-3
SO242/2_176_MICP-1-3	Microsensor profiler	2015-09-09T21:51	-7.07447	-88.4486	4102	2015-09-10T15:51	-7.0745	-88.44858	4102	Action: on ground/max depth; Position sensor: USBL; Comment: Start third Profiler 1 (MPI/AWI) measurement in undisturbed area; So242_2_176_MICP1-3
SO242/2_176_SLURP-1-holothurian	Slurp Gun	2015-09-09T22:25	-7.07417	-88.4487	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo sampling holoturian with slurp gun
SO242/2_176_SLURP-2-ophiroid-1	Slurp Gun	2015-09-09T22:41	-7.07414	-88.4487	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo slurp oph and chrinoid
SO242/2_176_SLURP-3-sponge	Slurp Gun	2015-09-09T22:49	-7.07414	-88.4487	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo sponge with isopode; sampled with slurp gun
SO242/2_176_SLURP-4-ophiroid-2	Slurp Gun	2015-09-09T22:58	-7.07414	-88.4487	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo ophiroid; sampled with slurp gun
SO242/2_177-1	Ocean Floor Observation System	2015-09-10T03:00	-7.07758	-88.4741	4139	2015-09-10T08:20	-7.0835	-88.4631	4157	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4141m
SO242/2_178-1	Benthic Crawler	2015-09-10T11:57	-7.07448	-88.4481	4141					Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length 4155m

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_179-1	Remote operated vehicle	2015-09-10T15:07	-7.07447	-88.4487	4050	2015-09-11T03:20	-7.0746	-88.4488	3944	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_179_MICP-2-1	Microsensor profiler	2015-09-10T15:23	-7.07467	-88.4483	4104	2015-09-11T01:05	-7.0747	-88.44834	4104	Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of profiler 2, valley released D179 (Waypoint: profiler 2 white spot D179)
SO242/2_179_BCRAWL	Benthic Crawler	2015-09-10T15:35	-7.07453	-88.448	4102					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of crawler and start of measurement
SO242/2_179_MICP-1-1	Microsensor profiler	2015-09-10T16:10	-7.07449	-88.4486	4103	2015-09-11T00:34	-7.0745	-88.44856	4103	Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of profiler placement at undistrubed spot next to track (Waypoint: Profiler 1 undisturbed D179)
SO242/2_179_PUC-60	Push corer	2015-09-10T16:23	-7.07449	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 81, 67, 60 (on undisturbed area close to profiler and track); PC diameter = 7.4 cm
SO242/2_179_PUC-67	Push corer	2015-09-10T16:23	-7.07449	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 81, 67, 60 (on undisturbed area close to profiler and track); PC diameter = 7.4 cm
SO242/2_179_PUC-81	Push corer	2015-09-10T16:23	-7.07449	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 81, 67, 60 (on undisturbed area close to profiler and track); PC diameter = 7.4 cm
SO242/2_179_PUC-9	Push corer	2015-09-10T16:34	-7.07449	-88.4486	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 9 in ripple valley in track. ripple with whitish stuff on top; PC diameter = 7.4 cm
SO242/2_179_PV-1	Photo/Video	2015-09-10T16:56	-7.0746	-88.4489	4101					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of Cube 2 (algae injected, 1 syringe still down)
SO242/2_179_PUC-10	Push corer	2015-09-10T17:07	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: PC 10 picked up for background samples; PC diameter = 7.4 cm
SO242/2_179_SLURP-1-holothurian-1	Slurp Gun	2015-09-10T17:26	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: holo in slurp chamber 1 on ROV
SO242/2_179_COLBOX-BLADE-3	Collector Box	2015-09-10T17:44	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: blade corer 3 picked up and placed before the push cores are pulled out
SO242/2_179_PUC-20	Push corer	2015-09-10T17:44	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 83,79,20 and blade core #3 in imprint of Cube 2; PC diameter = 7.4 cm
SO242/2_179_PUC-79	Push corer	2015-09-10T17:44	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 83,79,20 and blade core #3 in imprint of Cube 2; PC diameter = 7.4 cm
SO242/2_179_PUC-83	Push corer	2015-09-10T17:44	-7.0746	-88.4489	4103					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of PC 83,79,20 and blade core #3 in imprint of Cube 2; PC diameter = 7.4 cm
SO242/2_179_PUC-24	Push corer	2015-09-10T19:24	-7.07435	-88.4509	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PC 24 taken as control ; PC diameter = 7.4 cm
SO242/2_179_PUC-49	Push corer	2015-09-10T20:13	-7.07435	-88.4509	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of Cube 1 imprint and PC 55, 61, 49 in imprint; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_179_PUC-55	Push corer	2015-09-10T20:13	-7.07435	-88.4509	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of Cube 1 imprint and PC 55, 61, 49 in imprint; PC diameter = 7.4 cm
SO242/2_179_PUC-61	Push corer	2015-09-10T20:13	-7.07435	-88.4509	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Photo taken of Cube 1 imprint and PC 55, 61, 49 in imprint; PC diameter = 7.4 cm
SO242/2_179_COLBOX-BLADE-2	Collector Box	2015-09-10T20:19	-7.07435	-88.4509	4100					Action: on ground/max depth; Position sensor: USBL; Comment: bladecore 2 is placed and pressed into the sediment in imprint of Cube 1
SO242/2_179_PUC-74	Push corer	2015-09-10T20:54	-7.07454	-88.4508	4101					Action: on ground/max depth; Position sensor: USBL; Comment: PC74 taken for background at Cube 3; PC diameter = 7.4 cm
SO242/2_179_SLURP-2-holothurian-2	Slurp Gun	2015-09-10T21:03	-7.07454	-88.4508	4100					Action: on ground/max depth; Position sensor: USBL; Comment: holo from Cube 3 was slurped in to chamber 2
SO242/2_179_PUC-57	Push corer	2015-09-10T21:23	-7.07454	-88.4508	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PC 57 is pressed into the sediment imprint of Cube 3; PC diameter = 7.4 cm
SO242/2_179_PUC-78	Push corer	2015-09-10T21:24	-7.07454	-88.4508	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PC 78 is pressed into the sediment imprint of Cube 3; PC diameter = 7.4 cm
SO242/2_179_PUC-53	Push corer	2015-09-10T21:34	-7.07454	-88.4508	4100					Action: on ground/max depth; Position sensor: USBL; Comment: PC 53 is inserted again into sediment imprint of Cube 3; PC diameter = 7.4 cm
SO242/2_179_EG-3	Ekman grab	2015-09-10T23:41	-7.07421	-88.449	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Ekman-grab 3 into sediment next to elevator; EG dimensions: lengh=20 cm, width=20 cm; height=20 cm
SO242/2_179_COLBOX-EKMAN-1	Collector Box	2015-09-10T23:53	-7.07421	-88.449	4100					Action: on ground/max depth; Position sensor: USBL; Comment: Ekman# 3 and sampled sediment put into biobox 1
SO242/2_180-1	Boomerang-Lot	2015-09-11T08:13	-7.12897	-88.4518	4158	2015-09-14T16:44	-7.1308	-88.45183	4159	Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: Chamber-Lander (POLIRIS)
SO242/2_181	ParaSound	2015-09-11T08:20	-7.13203	-88.4502		2015-09-11T10:20	-7.1332	-88.44774		
SO242/2_181-1	ParaSound	2015-09-11T08:21	-7.13172	-88.4503	4157	2015-09-11T10:18	-7.1332	-88.4506	4172	Action: station start/station end; Position sensor: Ship-mounted DGPS; Comment: rwK: 180Â°, d: 1nm
SO242/2_182-1	Remote operated vehicle elevator	2015-09-11T13:23	-7.12523	-88.4506	4153					Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight: Cable Length 4162m
SO242/2_183-1	Remote operated vehicle	2015-09-11T16:31	-7.1252	-88.4508	4105	2015-09-12T02:05	-7.1251	-88.45039	4091	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_183_PV-1	Photo/Video	2015-09-11T16:51	-7.12527	-88.4504	4115	2015-09-11T16:55	-7.1253	-88.45043	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 11.09.2015 16:55:24)
SO242/2_183_PV-2	Photo/Video	2015-09-11T16:55	-7.12527	-88.4504	4116	2015-09-11T17:12	-7.1253	-88.45036	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 11.09.2015 17:12:15)
SO242/2_183_BFC-ROV-3	Benthic flux chamber	2015-09-11T17:01	-7.12527	-88.4504	4116	2015-09-15T22:01	-7.1253	-88.45043	4116	Action: on ground/max depth; Position sensor: USBL; Comment: BFC 3 (Benthic chamber 3) deployed without nodule
SO242/2_183_BFC-ROV-1	Benthic flux chamber	2015-09-11T17:26	-7.12531	-88.4504	4117	2015-09-15T23:26	-7.1253	-88.45036	4117	Action: on ground/max depth; Position sensor: USBL; Comment: BFC 1 (Benthic chamber 1) deployed with nodule
SO242/2_183_PV-3	Photo/Video	2015-09-11T17:30	-7.12531	-88.4504	4117	2015-09-11T17:33	-7.1253	-88.45036	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (11.09.2015 17:33:11)
SO242/2_183_BFC-CUBE-3	Benthic flux chamber	2015-09-11T18:11	-7.1255	-88.45	4117	2015-09-15T18:48	-7.1255	-88.44998	4117	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of BFC 3 (CUBE 3) deployment (with Holo)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_183_BFC-CUBE-2	Benthic flux chamber	2015-09-11T19:50	-7.12575	-88.4501	4118	2015-09-15T17:39	-7.1258	-88.45005	4118	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of BFC 2 (CUBE 2), zoomed in on Holothurian
SO242/2_183_EXP-CORRAL-1	Benthic Mesocosm Experiment	2015-09-11T20:26	-7.12536	-88.4511	4116	2015-09-15T20:36	-7.1254	-88.45109	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 1 (meiofauna corral) placed on seafloor
SO242/2_183_EXP-CORRAL-2	Benthic Mesocosm Experiment	2015-09-11T20:35	-7.12536	-88.4511	4116	2015-09-15T20:35	-7.1254	-88.45109	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 2 (meiofauna corral 2) placed on seafloor
SO242/2_183_EXP-CORRAL-6	Benthic Mesocosm Experiment	2015-09-11T20:56	-7.12529	-88.4511	4116	2015-09-15T21:21	-7.1253	-88.4511	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 6 (meiofauna corral 6) placed on seafloor
SO242/2_183_EXP-CORRAL-3	Benthic Mesocosm Experiment	2015-09-11T21:55	-7.12526	-88.4511	4115	2015-09-15T21:19	-7.1253	-88.45108	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 3 (meiofauna corral 3) placed on seafloor
SO242/2_183_EXP-CORRAL-5	Benthic Mesocosm Experiment	2015-09-11T22:15	-7.12523	-88.4511	4115	2015-09-15T22:03	-7.1252	-88.45107	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 5 (meiofauna corral 5) placed on seafloor
SO242/2_183_EXP-CORRAL-4	Benthic Mesocosm Experiment	2015-09-11T22:27	-7.12519	-88.4511	4115	2015-09-15T22:01	-7.1252	-88.45107	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of EXP 4 (meiofauna corral 4) placed on seafloor
SO242/2_183_EXP-CORE-1	Benthic Mesocosm Experiment	2015-09-11T23:12	-7.12514	-88.4503	4116	2015-09-22T20:06	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 1 (experimental core 1) placed on seafloor
SO242/2_183_EXP-CORE-2	Benthic Mesocosm Experiment	2015-09-11T23:17	-7.12514	-88.4503	4116	2015-09-22T19:46	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 2 (experimental core 2) placed on seafloor
SO242/2_183_EXP-CORE-3	Benthic Mesocosm Experiment	2015-09-11T23:23	-7.12514	-88.4503	4116	2015-09-22T19:46	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 3 (experimental core 3) placed on seafloor
SO242/2_183_EXP-SEDIMENT-3	Benthic Mesocosm Experiment	2015-09-11T23:41	-7.12514	-88.4503	4116	2015-09-22T19:46	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 3 (sediment dispenser 3) deployed
SO242/2_183_PV-4	Photo/Video	2015-09-11T23:53	-7.12514	-88.4503	4116	2015-09-11T23:57	-7.1251	-88.45034	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 11.09.2015 23:56:59)
SO242/2_183_EXP-SEDIMENT-2	Benthic Mesocosm Experiment	2015-09-11T23:56	-7.12514	-88.4503	4116	2015-09-22T19:46	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 2 (sediment dispenser 2) deployed
SO242/2_183_PV-5	Photo/Video	2015-09-12T00:08	-7.12514	-88.4503	4116	2015-09-12T00:10	-7.1251	-88.45034	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (Until 12.09.2015 00:10:23)
SO242/2_183_EXP-SEDIMENT-1	Benthic Mesocosm Experiment	2015-09-12T00:08	-7.12514	-88.4503	4116	2015-09-22T20:06	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 1 (sediment dispenser 1) deployed
SO242/2_183_EXP-CORE-4	Benthic Mesocosm Experiment	2015-09-12T00:18	-7.12514	-88.4503	4115	2015-09-22T18:03	-7.1251	-88.45034	4115	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 4 (experimental core 4) placed on seafloor
SO242/2_183_EXP-CORE-5	Benthic Mesocosm Experiment	2015-09-12T00:23	-7.12514	-88.4503	4116	2015-09-22T18:47	-7.1251	-88.45034	4116	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 5 (experimental core 5) placed on seafloor
SO242/2_183_EXP-CORE-6	Benthic Mesocosm Experiment	2015-09-12T00:29	-7.12514	-88.4503	4111	2015-09-22T18:47	-7.1251	-88.45034	4111	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: EXP 6 (experimental core 6) placed on seafloor
SO242/2_184-1	Ocean Floor Observation System	2015-09-12T03:54	-7.12755	-88.4533	4153	2015-09-12T07:37	-7.1143	-88.45021	4128	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4162m
SO242/2_185-1	Remote operated vehicle elevator	2015-09-12T11:01	-7.12537	-88.4502	4145					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Bottom Sight, Cable Length 4168m, released

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_186-1	Boomerang-Lot	2015-09-12T13:29	-7.07613	-88.5268	4106	2015-09-15T04:34	-7.0761	-88.52677	4106	Action: hoisting; Position sensor: USBL; Comment: Chamber & Profiler-Lander 1 (AWI/MPI)
SO242/2_187-1	Boomerang-Lot	2015-09-12T14:02	-7.07845	-88.4744	4136	2015-09-15T07:03	-7.0785	-88.47437	4136	Action: hoisting; Position sensor: USBL; Comment: Chamber & Profiler-Lander 2 (AWI/MPI)
SO242/2_188-1	Remote operated vehicle	2015-09-12T16:26	-7.1252	-88.4507	4179	2015-09-13T00:55	-7.1254	-88.45072	4194	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_188_PV-1	Photo/Video	2015-09-12T16:59	-7.12532	-88.4504	4197	2015-09-12T17:05	-7.1253	-88.45043	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 12.09.2015 17:05:43)
SO242/2_188_BFC-ROV-2	Benthic flux chamber	2015-09-12T17:04	-7.12527	-88.4504	4197	2015-09-16T22:04	-7.1253	-88.4504	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Benthic flux chamber 2 placed on sediment with polymetallic nodule. Benthic flux chamber 2 sediment surface flush with green ring = 12.5 cm overlying water height
SO242/2_188_BFC-ROV-4	Benthic flux chamber	2015-09-12T17:11	-7.12532	-88.4504	4197	2015-09-16T22:11	-7.1253	-88.45043	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Benthic flux chamber 4 placed on sediment without polymetallic nodule, adjacent to benthic flux chamber 2. Benthic flux chamber 4 sediment surface between white and blue ring = ca. 8.0 cm overl
SO242/2_188_PV-2	Photo/Video	2015-09-12T17:13	-7.1253	-88.4504	4197	2015-09-12T17:14	-7.1253	-88.45044	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 12.09.2015 17:14:17)
SO242/2_188_EXP-CORRAL-1	Benthic Mesocosm Experiment	2015-09-12T18:18	-7.12536	-88.4507	4197	2015-09-16T16:10	-7.1254	-88.4507	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #1 placed over Scotoplanes sp. and sediment K (artificial sediment spiked with copper) dispensed.
SO242/2_188_EXP-CORRAL-2	Benthic Mesocosm Experiment	2015-09-12T18:49	-7.12539	-88.4504	4198	2015-09-16T16:52	-7.1254	-88.45036	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #2 placed over Benthodytes sp. and sediment G (artificial sediment) dispensed.
SO242/2_188_EXP-CORRAL-3	Benthic Mesocosm Experiment	2015-09-12T19:41	-7.12542	-88.4503	4198	2015-09-16T17:33	-7.1254	-88.45031	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #3 placed over Scotoplanes sp. and sediment H (artificial sediment) dispensed.
SO242/2_188_EXP-CORRAL-4	Benthic Mesocosm Experiment	2015-09-12T19:59	-7.12536	-88.4503	4198	2015-09-16T17:59	-7.1254	-88.45025	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #4 placed over Scotoplanes sp. and sediment J (artificial sediment spiked with copper) dispensed.
SO242/2_188_EXP-CORRAL-5	Benthic Mesocosm Experiment	2015-09-12T20:23	-7.12586	-88.4506	4199	2015-09-16T18:36	-7.1259	-88.45063	4199	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #5 placed over Scotoplanes sp. and sediment F (artificial sediment) dispensed.
SO242/2_188_EXP-CORRAL-6	Benthic Mesocosm Experiment	2015-09-12T20:46	-7.12619	-88.4503	4200	2015-09-16T19:01	-7.1262	-88.45028	4200	Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #6 placed over Scotoplanes sp. and no sediment dispensed.
SO242/2_188_ISCHAM-BICS-4	In situ incubation chamber	2015-09-12T20:59	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: BICS chamber #4 closed for background respiration
SO242/2_188_PV-3	Photo/Video	2015-09-12T21:30	-7.12583	-88.4509	4199					Action: on ground/max depth; Position sensor: USBL; Comment: Sediment disturbed as ecotox holothurian enclosure corral #7 is placed over Benthodytes sp. and Benthodytes sp. begins swimming. Ecotox holothurian enclosure corral #7 moved to undisturbed sedi

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_188_PV-4	Photo/Video	2015-09-12T21:47	-7.12561	-88.4506	4198					Action: on ground/max depth; Position sensor: USBL; Comment: Ecotox holothurian enclosure corral #8 placed over Scotoplanes sp. and no sediment dispensed.
SO242/2_188_SLURP-1-holothurian-1	Slurp Gun	2015-09-12T22:25	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes sp. sampled with suction pump for delivery to BICS.
SO242/2_188_ISCHAM-BICS-2-holothurian-1	In situ incubation chamber	2015-09-12T22:31	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes sp. delivered to BICS chamber 2 and chamber 2 closed.
SO242/2_188_PV-5	Photo/Video	2015-09-12T22:35	-7.1254	-88.4507	4197	2015-09-12T22:36	-7.1254	-88.45073	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 12.09.2015 22:36:22)
SO242/2_188_SLURP-2-holothurian-2	Slurp Gun	2015-09-12T22:46	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Synallactes sp. sampled with suction pump for delivery to BICS.
SO242/2_188_ISCHAM-BICS-1-holothurian-2	In situ incubation chamber	2015-09-12T22:51	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Synallactes sp. delivered to BICS chamber 1 and chamber 1 closed.
SO242/2_188_SLURP-3-holothurian-3	Slurp Gun	2015-09-12T23:01	-7.12503	-88.4506	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Paeleopatides sp. sampled with suction pump for delivery to BICS.
SO242/2_188_ISCHAM-BICS-3-holothurian-3	In situ incubation chamber	2015-09-12T23:07	-7.1254	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Paeleopatides sp. delivered to BICS chamber 3 and chamber 3 closed.
SO242/2_188_PV-6	Photo/Video	2015-09-12T23:10	-7.1254	-88.4507	4197	2015-09-12T23:16	-7.1254	-88.45073	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 12.09.2015 23:16:05)
SO242/2_189-1	Ocean Floor Observation System	2015-09-13T02:55	-7.07542	-88.4745	4140	2015-09-13T09:33	-7.0792	-88.47215	4137	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length: 4141m
SO242/2_190-1	CTD/Rosette	2015-09-13T10:43	-7.08907	-88.4461	-4005					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 700 m
SO242/2_191-1	Remote operated vehicle	2015-09-13T16:00	-7.09005	-88.4463	4185	2015-09-13T20:26	-7.0898	-88.44629	4187	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_191_HYSP-1	Hyperspectral Imager	2015-09-13T16:51	-7.08953	-88.446	4194	2015-09-13T16:52	-7.0896	-88.44602	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_1: SO242_2_191_0913_1651: First UHI recording. Scan of the plastic piece. Setting forward power to 2 % for constant velocity approx. 0.05 m/s, altitude 1.2m. No LED lig
SO242/2_191_HYSP-2	Hyperspectral Imager	2015-09-13T16:55	-7.08958	-88.446	4194	2015-09-13T16:56	-7.0896	-88.44603	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_2: SO242_2_191_0913_1655: 3 m transect. Contains nodule and possibly small sponge. Ophiurid passed at approx 16:56:00.
SO242/2_191_HYSP-3	Hyperspectral Imager	2015-09-13T16:58	-7.0896	-88.446	4194	2015-09-13T16:59	-7.0896	-88.44604	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_3: SO242_2_191_0913_1658: 2 m transect. LED-lamps were turned on from this scan until the end. All available lighting on.
SO242/2_191_HYSP-4	Hyperspectral Imager	2015-09-13T17:03	-7.08962	-88.446	4195	2015-09-13T17:04	-7.0896	-88.44604	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_4: SO242_2_191_0913_1703: 3 m transect. Contains Sponge
SO242/2_191_HYSP-5	Hyperspectral Imager	2015-09-13T17:06	-7.08966	-88.4461	4195	2015-09-13T17:07	-7.0897	-88.44606	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_5: SO242_2_191_0913_1706: 3 m transect. Nodules.

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_191_HYSP-6	Hyperspectral Imager	2015-09-13T17:12	-7.0897	-88.4461	4194	2015-09-13T17:13	-7.0897	-88.44607	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_6: SO242_2_191_0913_1712: 3 m transect. Nodule with sponge and ophiurid.
SO242/2_191_HYSP-7	Hyperspectral Imager	2015-09-13T17:14	-7.08973	-88.4461	4194	2015-09-13T17:15	-7.0897	-88.44607	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_7: SO242_2_191_0913_1714: 3 m transect. Dead salp and spiral feces (enteropneust)
SO242/2_191_HYSP-8	Hyperspectral Imager	2015-09-13T17:17	-7.08972	-88.4461	4194	2015-09-13T17:18	-7.0897	-88.4461	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_8: SO242_2_191_0913_1717: Track with seacucumber / salp.
SO242/2_191_HYSP-9	Hyperspectral Imager	2015-09-13T17:21	-7.08977	-88.4461	4194	2015-09-13T17:22	-7.0898	-88.4461	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_9: SO242_2_191_0913_1721: Longer transect with 4 nodules and a reddish animal (crustacean at approx. 17:21:35). Altitude adjusted to 0.8 m.
SO242/2_191_HYSP-10	Hyperspectral Imager	2015-09-13T17:24	-7.08977	-88.4461	4194	2015-09-13T17:25	-7.0898	-88.4461	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_10: SO242_2_191_0913_1724: Transect with sponge
SO242/2_191_HYSP-11	Hyperspectral Imager	2015-09-13T17:28	-7.08982	-88.4461	4194	2015-09-13T17:35	-7.0897	-88.44594	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_11: SO242_2_191_0913_1728: 20 m transect. Crinoid and big trace at approx. 17:30:35. Xenophyophores, small crab and small coral at approx. 17:33:56.
SO242/2_191_HYSP-12	Hyperspectral Imager	2015-09-13T17:38	-7.08975	-88.446	4195	2015-09-13T17:40	-7.0898	-88.44595	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_12: SO242_2_191_0913_1738: 5 m transect. Only nodules, no bigger life.
SO242/2_191_HYSP-13	Hyperspectral Imager	2015-09-13T17:41	-7.08976	-88.446	4195	2015-09-13T17:48	-7.0898	-88.44612	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_13: SO242_2_191_0913_1741: 20 m transect. Crustacean and dead salp at start. Crinoids and xenophyophore at approx. 17:44:41.
SO242/2_191_HYSP-14	Hyperspectral Imager	2015-09-13T17:53	-7.08977	-88.4461	4194	2015-09-13T17:55	-7.0898	-88.44615	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_14: SO242_2_191_0913_1753-3: Transect for nodulesampling, 3 nodules in a row. The sampled nodules are marked as Nodule 1 and Nodule 2
SO242/2_191_SCOOP-1-nodule-1	Scoop/Biobox	2015-09-13T18:03	-7.08979	-88.4461	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_SCOOP_1: Samp. Nodule 1
SO242/2_191_SCOOP-2-nodule-2	Scoop/Biobox	2015-09-13T18:08	-7.08979	-88.4461	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_SCOOP_2: Sampling of Nodule 2. Put into the back of the drawer.
SO242/2_191_SCOOP-3-nodule-3	Scoop/Biobox	2015-09-13T18:35	-7.08977	-88.4463	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_SCOOP_3: Sampling of Nodule 3. Sample SO242-2_D191_SCOOP_4: Sponge with ID SO242-2-191-Porifera#1 (maybe doublecheck this with Alastair) Sponge broke off during sampling,
SO242/2_192-1	ParaSound	2015-09-13T22:13	-6.8386	-88.4502	4219	2015-09-14T15:09	-7.1294	-88.4495	4145	Action: station start/station end; Position sensor: Ship-mounted DGPS; Comment: rwK: 135Â°, d: 7nm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_192	ParaSound	2015-09-14T09:40	-6.99984	-88.5014		2015-09-14T15:15	-7.1305	-88.45338		
SO242/2_191_HYSP-15	Hyperspectral Imager	2015-09-14T18:16	-7.08979	-88.4463	4195	2015-09-14T18:18	-7.0898	-88.4463	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Sample SO242-2_D191_HYSP_15: SO242_2_191_0913_1816: Transect for nodulesampling. Nodule 3 (Nodule with crinoid)
SO242/2_193-1	CTD/Rosette	2015-09-14T19:06	-7.1254	-88.4502	-4140					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4140 m
SO242/2_194-1	MultiCorer	2015-09-15T02:36	-7.07612	-88.5266	4079					Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length: 4166m
SO242/2_195-1	Ocean Floor Observation System	2015-09-15T09:06	-7.125	-88.45	4152	2015-09-15T13:13	-7.1165	-88.43734	4188	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length 4170m
SO242/2_196-1	Remote operated vehicle	2015-09-15T15:25	-7.12548	-88.451	4181	2015-09-16T01:21	-7.1254	-88.45061	4018	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_196_SCOOP-1-nodule-1	Scoop/Biobox	2015-09-15T15:55	-7.12518	-88.4507	4195					Action: on ground/max depth; Position sensor: USBL; Comment: photo of nodule with sponge, collected on scoop
SO242/2_196_ISCHAM-Nodule-3	In situ incubation chamber	2015-09-15T16:04	-7.1254	-88.4508	4196					Action: on ground/max depth; Position sensor: USBL; Comment: start of chamber 3: 11:03 (SO242-2_D196_ISCHAM3)
SO242/2_196_SCOOP-2-nodule-2	Scoop/Biobox	2015-09-15T16:22	-7.12517	-88.4508	4196					Action: on ground/max depth; Position sensor: USBL; Comment: photo of nodule for chamber 2 in scoop (SO242-2_D196_ISCHAM2-nodule)
SO242/2_196_ISCHAM-Nodule-2	In situ incubation chamber	2015-09-15T16:28	-7.1254	-88.4508	4196					Action: on ground/max depth; Position sensor: USBL; Comment: chamber 2 start: 11:28 (SO242-2_D196_ISCHAM2)
SO242/2_196_SCOOP-3-nodule-3	Scoop/Biobox	2015-09-15T16:36	-7.12509	-88.4507	4195					Action: on ground/max depth; Position sensor: USBL; Comment: photo of nodule with xeno for chamber 1 (SO242-2_D196_ISCHAM1-nodule)
SO242/2_196_PUC-28	Push corer	2015-09-15T16:41	-7.12509	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PC 28 in sediment (SO242-2_D196_PUC28); PC diameter = 7.4 cm
SO242/2_196_ISCHAM-Nodule-1	In situ incubation chamber	2015-09-15T16:53	-7.1254	-88.4508	4196					Action: on ground/max depth; Position sensor: USBL; Comment: start chamber 1: 11:53 (SO242-2_D196_ISCHAM1)
SO242/2_196_SLURP-1-holothurian-1	Slurp Gun	2015-09-15T17:35	-7.12568	-88.4501	4199					Action: on ground/max depth; Position sensor: USBL; Comment: holothurian of cube 2 is slurped in chamber 1 of ROV carussel (SO242-2_D183_BFC_CUBE#2-holothurian)
SO242/2_196_BCROV-1	Blade core	2015-09-15T17:55	-7.12568	-88.4501	4199					Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 2 area, pushcores 60 (SO242-2_D196_PUC60), 26 (SO242-2_D196_PUC26), 45 (SO242-2_D196_PUC45) and blade core 1 (SO242-2_D196_BCROV1) in sediment; BCROV dimensions: lengh=20 cm, widt
SO242/2_196_PUC-26	Push corer	2015-09-15T17:55	-7.12568	-88.4501	4199					Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 2 area, pushcores 60 (SO242-2_D196_PUC60), 26 (SO242-2_D196_PUC26), 45 (SO242-2_D196_PUC45) and blade core 1 (SO242-2_D196_BCROV1) in sediment; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_196_PUC-45	Push corer	2015-09-15T17:55	-7.12568	-88.4501	4199					Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 2 area, pushcores 60 (SO242-2_D196_PUC60), 26 (SO242-2_D196_PUC26), 45 (SO242-2_D196_PUC45) and blade core 1 (SO242-2_D196_BCROV1) in sediment; PC diameter = 7.4 cm
SO242/2_196_PUC-60	Push corer	2015-09-15T17:55	-7.12568	-88.4501	4199					Action: on ground/max depth; Position sensor: USBL; Comment: photo of cube 2 area, pushcores 60 (SO242-2_D196_PUC60), 26 (SO242-2_D196_PUC26), 45 (SO242-2_D196_PUC45) and blade core 1 (SO242-2_D196_BCROV1) in sediment; PC diameter = 7.4 cm
SO242/2_196_SLURP-2-holothurian-2	Slurp Gun	2015-09-15T18:42	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: holo was slurped in (SO242-2_D183_BFC_CUBE#3-holothurian)
SO242/2_196_BCROV-3	Blade core	2015-09-15T19:01	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 76 (SO242-1_D196_PUC76), 78 (SO242-1_D196_PUC78), 47 (SO242-1_D196_PUC47) and bladecore 3 (SO242-2_D196_BCROV3) in sediment; BCROV dimensions: lengh=20 cm, width=9 cm; height=
SO242/2_196_PUC-47	Push corer	2015-09-15T19:01	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 76 (SO242-1_D196_PUC76), 78 (SO242-1_D196_PUC78), 47 (SO242-1_D196_PUC47) and bladecore 3 (SO242-2_D196_BCROV3) in sediment; PC diameter = 7.4 cm
SO242/2_196_PUC-76	Push corer	2015-09-15T19:01	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 76 (SO242-1_D196_PUC76), 78 (SO242-1_D196_PUC78), 47 (SO242-1_D196_PUC47) and bladecore 3 (SO242-2_D196_BCROV3) in sediment; PC diameter = 7.4 cm
SO242/2_196_PUC-78	Push corer	2015-09-15T19:01	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 76 (SO242-1_D196_PUC76), 78 (SO242-1_D196_PUC78), 47 (SO242-1_D196_PUC47) and bladecore 3 (SO242-2_D196_BCROV3) in sediment; PC diameter = 7.4 cm
SO242/2_196_BCROV-4	Blade core	2015-09-15T19:09	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: background bladecore (SO242-2_D196_BCROV?) is taken next to the cube 3 incuabtion location; BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_196_BCROV-2	Blade core	2015-09-15T19:17	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 81 (SO242-2_D196_PUC81), 33 (SO242-2_D196_PUC33), 69 (SO242-2_D196_PUC69) and bladecore 2 (SO242-2_D196_BCROV2) in sediment; BCROV dimensions: lengh=20 cm, width=9 cm; height=
SO242/2_196_PUC-33	Push corer	2015-09-15T19:17	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 81 (SO242-2_D196_PUC81), 33 (SO242-2_D196_PUC33), 69 (SO242-2_D196_PUC69) and bladecore 2 (SO242-2_D196_BCROV2) in sediment; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_196_PUC-69	Push corer	2015-09-15T19:17	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 81 (SO242-2_D196_PUC81), 33 (SO242-2_D196_PUC33), 69 (SO242-2_D196_PUC69) and bladecore 2 (SO242-2_D196_BCROV2) in sediment; PC diameter = 7.4 cm
SO242/2_196_PUC-81	Push corer	2015-09-15T19:17	-7.12548	-88.45	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of pushcore 81 (SO242-2_D196_PUC81), 33 (SO242-2_D196_PUC33), 69 (SO242-2_D196_PUC69) and bladecore 2 (SO242-2_D196_BCROV2) in sediment; PC diameter = 7.4 cm
SO242/2_196_PV-1	Photo/Video	2015-09-15T20:09	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 1 (SO242-2_D183_EXP-MEIOCORRAL#1) with pushcores 52 (SO242-2_D196_PUC52), 65 (SO242-2_D196_PUC65), 63 (SO242-2_D196_PUC63)
SO242/2_196_PUC-52	Push corer	2015-09-15T20:09	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 1 (SO242-2_D183_EXP-MEIOCORRAL#1) with pushcores 52 (SO242-2_D196_PUC52), 65 (SO242-2_D196_PUC65), 63 (SO242-2_D196_PUC63); PC diameter = 7.4 cm
SO242/2_196_PUC-63	Push corer	2015-09-15T20:09	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 1 (SO242-2_D183_EXP-MEIOCORRAL#1) with pushcores 52 (SO242-2_D196_PUC52), 65 (SO242-2_D196_PUC65), 63 (SO242-2_D196_PUC63); PC diameter = 7.4 cm
SO242/2_196_PUC-65	Push corer	2015-09-15T20:09	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 1 (SO242-2_D183_EXP-MEIOCORRAL#1) with pushcores 52 (SO242-2_D196_PUC52), 65 (SO242-2_D196_PUC65), 63 (SO242-2_D196_PUC63); PC diameter = 7.4 cm
SO242/2_196_PV-2	Photo/Video	2015-09-15T20:26	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 2 (SO242-2_D183_EXP-MEIOCORRAL#2) with pushcores 9 (SO242-2_D196_PUC9), 58 (SO242-2_D196_PUC58), 80 (SO242-2_D196_PUC80)
SO242/2_196_PUC-58	Push corer	2015-09-15T20:26	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 2 (SO242-2_D183_EXP-MEIOCORRAL#2) with pushcores 9 (SO242-2_D196_PUC9), 58 (SO242-2_D196_PUC58), 80 (SO242-2_D196_PUC80); PC diameter = 7.4 cm
SO242/2_196_PUC-80	Push corer	2015-09-15T20:26	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 2 (SO242-2_D183_EXP-MEIOCORRAL#2) with pushcores 9 (SO242-2_D196_PUC9), 58 (SO242-2_D196_PUC58), 80 (SO242-2_D196_PUC80); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_196_PUC-9	Push corer	2015-09-15T20:26	-7.12537	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 2 (SO242-2_D183_EXP-MEIOCORRAL#2) with pushcores 9 (SO242-2_D196_PUC9), 58 (SO242-2_D196_PUC58), 80 (SO242-2_D196_PUC80); PC diameter = 7.4 cm
SO242/2_196_PV-3	Photo/Video	2015-09-15T21:00	-7.12531	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 6 (SO242-2_D183_EXP-MEIOCORRAL#6) with pushcores 20 (SO242-2_D196_PUC20), 57 (SO242-2_D196_PUC57), 74 (SO242-2_D196_PUC74)
SO242/2_196_PUC-20	Push corer	2015-09-15T21:00	-7.12531	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 6 (SO242-2_D183_EXP-MEIOCORRAL#6) with pushcores 20 (SO242-2_D196_PUC20), 57 (SO242-2_D196_PUC57), 74 (SO242-2_D196_PUC74); PC diameter = 7.4 cm
SO242/2_196_PUC-57	Push corer	2015-09-15T21:00	-7.12531	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 6 (SO242-2_D183_EXP-MEIOCORRAL#6) with pushcores 20 (SO242-2_D196_PUC20), 57 (SO242-2_D196_PUC57), 74 (SO242-2_D196_PUC74); PC diameter = 7.4 cm
SO242/2_196_PUC-74	Push corer	2015-09-15T21:00	-7.12531	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 6 (SO242-2_D183_EXP-MEIOCORRAL#6) with pushcores 20 (SO242-2_D196_PUC20), 57 (SO242-2_D196_PUC57), 74 (SO242-2_D196_PUC74); PC diameter = 7.4 cm
SO242/2_196_PV-4	Photo/Video	2015-09-15T21:13	-7.12527	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 3 (SO242-2_D183_EXP-MEIOCORRAL#3) with pushcores 24 (SO242-2_D196_PUC24), 49 (SO242-2_D196_PUC49), 83 (SO242-2_D196_PUC83)
SO242/2_196_PUC-24	Push corer	2015-09-15T21:13	-7.12527	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 3 (SO242-2_D183_EXP-MEIOCORRAL#3) with pushcores 24 (SO242-2_D196_PUC24), 49 (SO242-2_D196_PUC49), 83 (SO242-2_D196_PUC83); PC diameter = 7.4 cm
SO242/2_196_PUC-49	Push corer	2015-09-15T21:13	-7.12527	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 3 (SO242-2_D183_EXP-MEIOCORRAL#3) with pushcores 24 (SO242-2_D196_PUC24), 49 (SO242-2_D196_PUC49), 83 (SO242-2_D196_PUC83); PC diameter = 7.4 cm
SO242/2_196_PUC-83	Push corer	2015-09-15T21:13	-7.12527	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 3 (SO242-2_D183_EXP-MEIOCORRAL#3) with pushcores 24 (SO242-2_D196_PUC24), 49 (SO242-2_D196_PUC49), 83 (SO242-2_D196_PUC83); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_196_PV-5	Photo/Video	2015-09-15T21:42	-7.12524	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 5 (SO242-2_D183_EXP-MEIOCORRAL#5) with pushcores 10 (SO242-2_D196_PUC10), 61 (SO242-2_D196_PUC61), 67 (SO242-2_D196_PUC67)
SO242/2_196_PUC-10	Push corer	2015-09-15T21:42	-7.12524	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 5 (SO242-2_D183_EXP-MEIOCORRAL#5) with pushcores 10 (SO242-2_D196_PUC10), 61 (SO242-2_D196_PUC61), 67 (SO242-2_D196_PUC67); PC diameter = 7.4 cm
SO242/2_196_PUC-61	Push corer	2015-09-15T21:42	-7.12524	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 5 (SO242-2_D183_EXP-MEIOCORRAL#5) with pushcores 10 (SO242-2_D196_PUC10), 61 (SO242-2_D196_PUC61), 67 (SO242-2_D196_PUC67); PC diameter = 7.4 cm
SO242/2_196_PUC-67	Push corer	2015-09-15T21:42	-7.12524	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 5 (SO242-2_D183_EXP-MEIOCORRAL#5) with pushcores 10 (SO242-2_D196_PUC10), 61 (SO242-2_D196_PUC61), 67 (SO242-2_D196_PUC67); PC diameter = 7.4 cm
SO242/2_196_PV-6	Photo/Video	2015-09-15T21:53	-7.12521	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 4 (SO242-2_D183_EXP_MEIOCORRAL#4) with pushcore 79 (SO242-2_D196_PUC79), 53 (SO242-2_D196_PUC53), 18 (SO242-2_D196_PUC18)
SO242/2_196_PUC-18	Push corer	2015-09-15T21:53	-7.12521	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 4 (SO242-2_D183_EXP_MEIOCORRAL#4) with pushcore 79 (SO242-2_D196_PUC79), 53 (SO242-2_D196_PUC53), 18 (SO242-2_D196_PUC18); PC diameter = 7.4 cm
SO242/2_196_PUC-53	Push corer	2015-09-15T21:53	-7.12521	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 4 (SO242-2_D183_EXP_MEIOCORRAL#4) with pushcore 79 (SO242-2_D196_PUC79), 53 (SO242-2_D196_PUC53), 18 (SO242-2_D196_PUC18); PC diameter = 7.4 cm
SO242/2_196_PUC-79	Push corer	2015-09-15T21:53	-7.12521	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: photo of corral 4 (SO242-2_D183_EXP_MEIOCORRAL#4) with pushcore 79 (SO242-2_D196_PUC79), 53 (SO242-2_D196_PUC53), 18 (SO242-2_D196_PUC18); PC diameter = 7.4 cm
SO242/2_196_SCOOP-4-nodule-4	Scoop/Biobox	2015-09-15T23:05	-7.12529	-88.4503	4198					Action: on ground/max depth; Position sensor: USBL; Comment: photo of nodule in scoop with dirt (SO242-2_D188_BFC1-nodule)
SO242/2_197-1	Ocean Floor Observation System	2015-09-16T04:36	-7.06703	-88.4822	4140	2015-09-16T13:15	-7.0961	-88.45841	4116	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4152m
SO242/2_230-1	Boomerang-Lot	2015-09-16T07:43	-7.1237	-88.4256	4162	2015-09-26T23:47	-7.1235	-88.42653	4144	Action: released; Position sensor: Ship-mounted DGPS; Comment: Recovery of BoBo-Lander (SO242-1_97-1)
SO242/2_212-2	Boomerang-Lot	2015-09-16T15:00	-7.07113	-88.4827	4131	2015-09-21T11:45	-7.0701	-88.48463	4119	Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: Recovery DOS-Lander (SO242-1_99-1)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_198-1	Remote operated vehicle	2015-09-16T15:17	-7.12562	-88.4509	4167	2015-09-16T23:52	-7.1254	-88.45039	4179	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_198_ISCHAM-BICS-1		2015-09-16T15:34	-7.1254	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Synallactes sp. in BICS chamber #1 is active
SO242/2_198_ISCHAM-BICS-3	In situ incubation chamber	2015-09-16T15:35	-7.1254	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Paeleopatides sp. in BICS chamber #3 is active
SO242/2_198_ISCHAM-BICS-2	In situ incubation chamber	2015-09-16T15:36	-7.1254	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Scotoplanes sp. in BICS chamber #2 is active
SO242/2_198_PV-1	Photo/Video	2015-09-16T15:39	-7.12534	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #1 with Scotoplanes sp.
SO242/2_198_SLURP-1-holothurian-1	Slurp Gun	2015-09-16T15:45	-7.12534	-88.4507	4196					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#1-holothurian sampled with suction pump: container #1 & #2
SO242/2_198_PUC-32	Push corer	2015-09-16T16:00	-7.12534	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC32 (ecotox holothurian enclosure corral #1 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-71	Push corer	2015-09-16T16:01	-7.12534	-88.4507	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC71 (ecotox holothurian enclosure corral #1 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-2	Photo/Video	2015-09-16T16:26	-7.12535	-88.4503	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #2 with Benthodytes sp.
SO242/2_198_SLURP-3-holothurian-2	Slurp Gun	2015-09-16T16:34	-7.12535	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#2-holothurian sampled with suction pump: container #3
SO242/2_198_PUC-51	Push corer	2015-09-16T16:43	-7.12535	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC51 (ecotox holothurian enclosure corral #2 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-37	Push corer	2015-09-16T16:44	-7.12535	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC37 (ecotox holothurian enclosure corral #2 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-3	Photo/Video	2015-09-16T17:15	-7.1254	-88.4503	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #3 with Scotoplanes sp.
SO242/2_198_SLURP-4-holothurian-3	Slurp Gun	2015-09-16T17:20	-7.1254	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#3-holothurian sampled with suction pump: container #4
SO242/2_198_PUC-68	Push corer	2015-09-16T17:27	-7.1254	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC68 (ecotox holothurian enclosure corral #3 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-55	Push corer	2015-09-16T17:28	-7.1254	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC55 (ecotox holothurian enclosure corral #3 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-4	Photo/Video	2015-09-16T17:41	-7.12528	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #4 with Scotoplanes sp.
SO242/2_198_SLURP-5-holothurian-4	Slurp Gun	2015-09-16T17:43	-7.12528	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#4-holothurian sampled with suction pump: container #5

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_198_PUC-36	Push corer	2015-09-16T17:52	-7.12528	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC36 (ecotox holothurian enclosure corral #4 sediment; Sediment slightly disturbed during coring); PC diameter = 7.4 cm
SO242/2_198_PUC-34	Push corer	2015-09-16T17:53	-7.12528	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC34 (ecotox holothurian enclosure corral #4 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-5	Photo/Video	2015-09-16T18:18	-7.12584	-88.4506	4198					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #5 with Scotoplanes sp.
SO242/2_198_SLURP-6-holothurian-5	Slurp Gun	2015-09-16T18:23	-7.12584	-88.4506	4199					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#5-holothurian sampled with suction pump: container #6
SO242/2_198_PUC-59	Push corer	2015-09-16T18:30	-7.12584	-88.4506	4199					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC59 (ecotox holothurian enclosure corral #5 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-3	Push corer	2015-09-16T18:31	-7.12584	-88.4506	4199					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC3 (ecotox holothurian enclosure corral #5 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-6	Photo/Video	2015-09-16T18:41	-7.12621	-88.4503	4199					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #6 with Scotoplanes sp.
SO242/2_198_SLURP-7-holothurian-6	Slurp Gun	2015-09-16T18:44	-7.12621	-88.4503	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#6-holothurian sampled with suction pump: container #7
SO242/2_198_PUC-25	Push corer	2015-09-16T18:51	-7.12621	-88.4503	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC25 (ecotox holothurian enclosure corral #6 sediment; overfull; additional pushcore required); PC diameter = 7.4 cm
SO242/2_198_PUC-5	Push corer	2015-09-16T18:51	-7.12621	-88.4503	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC5 (ecotox holothurian enclosure corral #6 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-21	Push corer	2015-09-16T18:58	-7.12621	-88.4503	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC21 (additional pushcore for corral #6 sediment); PC diameter = 7.4 cm
SO242/2_198_PV-7	Photo/Video	2015-09-16T19:27	-7.12563	-88.4505	4197					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of ecotox holothurian enclosure corral #8 with Scotoplanes sp.
SO242/2_198_SLURP-8-holothurian-8	Slurp Gun	2015-09-16T19:32	-7.12563	-88.4505	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#8-holothurian sampled with suction pump: container #8
SO242/2_198_PUC-48	Push corer	2015-09-16T19:41	-7.12563	-88.4505	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC48 (ecotox holothurian enclosure corral #8 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-31	Push corer	2015-09-16T19:43	-7.12563	-88.4505	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC31 (ecotox holothurian enclosure corral #8 sediment); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_198_PV-8	Photo/Video	2015-09-16T20:10	-7.12586	-88.4508	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#7 (Benthodytes sp. Swimming)
SO242/2_198_SLURP-9-holothurian-7	Slurp Gun	2015-09-16T20:18	-7.12586	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D188_EXP-HOLOCORRAL#7-holothurian sampled with suction pump: no container
SO242/2_198_PUC-35	Push corer	2015-09-16T20:23	-7.12586	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC35 (ecotox holothurian enclosure corral #7 sediment); PC diameter = 7.4 cm
SO242/2_198_PUC-73	Push corer	2015-09-16T20:25	-7.12586	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D198_PUC73 (ecotox holothurian enclosure corral #7 sediment); PC diameter = 7.4 cm
SO242/2_198_COLBOX-DRAWER-1-nodule-1	Collector Box	2015-09-16T22:01	-7.12534	-88.4504	4198					Action: on ground/max depth; Position sensor: USBL; Comment: Benthic flux chamber #2 nodule sampled to port ROV drawer
SO242/2_199	ParaSound	2015-09-17T01:20	-7.12726	-88.4521		2015-09-17T05:20	-7.0806	-88.47095		
SO242/2_199-1	ParaSound	2015-09-17T01:32	-7.12642	-88.4553	4143	2015-09-17T05:22	-7.0804	-88.47115	4138	Action: station start/station end; Position sensor: Ship-mounted DGPS
SO242/2_200-1	Remote operated vehicle elevator	2015-09-17T08:07	-7.0832	-88.4694	3985					Action: max depth/on ground; Position sensor: Ship-mounted DGPS
SO242/2_201-1	Remote operated vehicle elevator	2015-09-17T12:13	-7.08338	-88.4693	4138					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: Bottom Sight, Cable Length 4161m, released
SO242/2_202-1	Remote operated vehicle	2015-09-17T15:30	-7.08302	-88.4696	4177	2015-09-18T01:37	-7.0826	-88.46989	4159	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_202_ISCHAM-BICS-4	In situ incubation chamber	2015-09-17T15:45	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: BICs respiration chamber 4 (ISCHAM-BICS-#4) on elevator 2 closed (ROV_E-#2)
SO242/2_202_ISCHAM-nodule-3	In situ incubation chamber	2015-09-17T16:08	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: ISCHAM-Nodule-#3-Nodule placed in ISCHAM-Nodule-#3
SO242/2_202_ISCHAM-nodule-2	In situ incubation chamber	2015-09-17T16:34	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: ISCHAM-Nodule-#2-Nodule placed in nodule respiration ISCHAM-Nodule-#2 and closed after a part of the stalk of the sponge was removed because it didn't fit in the chamber
SO242/2_202_ISCHAM-nodule-1	In situ incubation chamber	2015-09-17T16:56	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: ISCHAM-Nodule-#1-Nodule placed in ISCHAM-Nodule-#1, some arms of the crinoid removed because they sticked out and chamber closed.
SO242/2_202_MICP-1-1	Microsensor profiler	2015-09-17T17:40	-7.08277	-88.4697	4188	2015-09-17T20:58	-7.0828	-88.46971	4188	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 1 started
SO242/2_202_MICP-2-1	Microsensor profiler	2015-09-17T18:11	-7.08289	-88.4696	4188	2015-09-17T21:05	-7.0829	-88.46962	4188	Action: on ground/max depth; Position sensor: USBL; Comment: MICP-#2-1 placed in EBS track onto white scratches and pushed down into the sediment
SO242/2_202_BFC-ROV-1	Benthic flux chamber	2015-09-17T18:34	-7.08277	-88.4697	4187	2015-09-18T22:34	-7.0828	-88.46971	4187	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of white scratches for BFC-ROV-#1 placement taken
SO242/2_202_BFC-ROV-3	Benthic flux chamber	2015-09-17T19:16	-7.08298	-88.4696	4189	2015-09-18T23:16	-7.083	-88.46955	4189	Action: on ground/max depth; Position sensor: USBL; Comment: BFC-ROV-#3 placed in the center of the EBS track on white scratches and photo taken

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_202_PUC-80	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-76	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-26	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-69	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-63	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-65	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-17	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-74	Push corer	2015-09-17T19:56	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-9	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-52	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-49	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-57	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_202_PUC-33	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-60	Push corer	2015-09-17T20:11	-7.08256	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the EBS track; PC diameter = 7.4 cm
SO242/2_202_PUC-18	Push corer	2015-09-17T20:43	-7.08269	-88.4699	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUC-#18 + PUC-#24 taken in EBS side pile and photo taken; PC diameter = 7.4 cm
SO242/2_202_PUC-24	Push corer	2015-09-17T20:43	-7.08269	-88.4699	4190					Action: on ground/max depth; Position sensor: USBL; Comment: PUC-#18 + PUC-#24 taken in EBS side pile and photo taken; PC diameter = 7.4 cm
SO242/2_202_MICP-1-2	Microsensor profiler	2015-09-17T21:04	-7.08277	-88.4697	4188	2015-09-17T23:46	-7.0828	-88.46971	4188	Action: on ground/max depth; Position sensor: USBL; Comment: MICP-#1 replaced, Photo of MICP-#1-2 on the new spot taken
SO242/2_202_MICP-2-2	Microsensor profiler	2015-09-17T21:13	-7.08289	-88.4696	4188	2015-09-17T23:55	-7.0829	-88.46962	4188	Action: on ground/max depth; Position sensor: USBL; Comment: MICP-#2-2 replaced a few meters to the left and photo taken
SO242/2_202_BFC-CUBE-3	Benthic flux chamber	2015-09-17T21:48	-7.08292	-88.4693	4189	2015-09-21T22:43	-7.0829	-88.46929	4189	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of BFC-CUBE-#3 and its surrounding taken
SO242/2_202_BFC-CUBE-2	Benthic flux chamber	2015-09-17T22:04	-7.08289	-88.4693	4189	2015-09-21T23:00	-7.0829	-88.46926	4189	Action: on ground/max depth; Position sensor: USBL; Comment: cube 2 is positioned on old plough track
SO242/2_202_ISCHAM-BICS-3-holothurian-3	In situ incubation chamber	2015-09-17T22:19	-7.08282	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: The Holothurian Paeleopatides is slurped in with a slurp gun (ISCHAM-BICS-#3-holothurian)
SO242/2_202_ISCHAM-BICS-3	In situ incubation chamber	2015-09-17T22:24	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: The Holothurian ISCHAM-BICS-#3-holothurian is placed into the BICS respiration chamber 3 (IISCHAM-BICS-#3)
SO242/2_202_ISCHAM-BICS-1-holothurian-1	In situ incubation chamber	2015-09-17T22:27	-7.08283	-88.4694	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of Synallactes taken, and sluped in with a slurp gun (ISCHAM-BICS-#1-holothurian)
SO242/2_202_ISCHAM-BICS-1	In situ incubation chamber	2015-09-17T22:32	-7.08286	-88.4696	4188					Action: on ground/max depth; Position sensor: USBL; Comment: The Holothurian ISCHAM-BICS-#1-holothurian is placed into the BICS respiration chamber 1 (ISCHAM-BICS-#1-holothurian)
SO242/2_202_SLURP-1-holothurian	Slurp Gun	2015-09-17T22:42	-7.08247	-88.4693	4187					Action: on ground/max depth; Position sensor: USBL; Comment: Trial to slurp in the holothurian, but it is very large and blocks the pipe, it is half slurped in and transported (SLURP-#1-holothurian)
SO242/2_202_ISCHAM-BICS-2-holothurian-2	In situ incubation chamber	2015-09-17T22:58	-7.08347	-88.4701	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Holothurian is slurped in (ISCHAM-BICS-#2-holothurian) and ttansported to BICS respiration chamber 2 (ISCHAM-BICS-#2)
SO242/2_202_ISCHAM-BICS-2	In situ incubation chamber	2015-09-17T23:04	-7.08286	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: ISCHAM-BICS-#1-holothurian is placed in BICS respiration chamber 2
SO242/2_202_MICP-1-3	Microsensor profiler	2015-09-17T23:47	-7.08277	-88.4697	4189	2015-09-18T17:47	-7.0828	-88.46971	4189	Action: on ground/max depth; Position sensor: USBL; Comment: MICP-#1 placed outside the EBS track and activated (MICP-#1-3)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_202_MICP-2-3	Microsensor profiler	2015-09-18T00:03	-7.0826	-88.4699	4188	2015-09-18T18:03	-7.0826	-88.46986	4188	Action: on ground/max depth; Position sensor: USBL; Comment: Photo of profiler 2 (MICP-#2-3) in position taken
SO242/2_203-1	Ocean Floor Observation System	2015-09-18T03:27	-7.05398	-88.4671	4140	2015-09-18T12:47	-7.0991	-88.45482	4088	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4142m
SO242/2_204-1	CTD/Rosette	2015-09-18T14:00	-7.10138	-88.4543	-4136					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 2500 m
SO242/2_205-1	Remote operated vehicle	2015-09-18T17:08	-7.08282	-88.4699	4176	2015-09-19T01:52	-7.0826	-88.46975	4181	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_205_MICP-1-1	Microsensor profiler	2015-09-18T17:28	-7.08255	-88.4699	4188	2015-09-18T22:04	-7.0826	-88.46993	4188	Action: on ground/max depth; Position sensor: USBL; Comment: INFO: Deploying profiler 1 on white area in EBS track
SO242/2_205_MICP-2-1	Microsensor profiler	2015-09-18T17:43	-7.08256	-88.4699	4188	2015-09-18T20:43	-7.0826	-88.46992	4188	Action: on ground/max depth; Position sensor: USBL; Comment: INFO: Profiler 2 deployed in the EBS track on brown area next to Prof 1
SO242/2_205_SLURP-1-holothurian-1	Slurp Gun	2015-09-18T18:04	-7.08274	-88.47	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP0: first holothurian slurped, scotoplanes
SO242/2_205_COLBOX-1-holothurian-1	Collector Box	2015-09-18T18:09	-7.08274	-88.47	4188					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_COLBOX1 Paeleopatides in the biobox
SO242/2_205_SLURP-1-holothurian-2	Slurp Gun	2015-09-18T18:18	-7.08273	-88.4705	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP1: Amperima in slurpgun container 1
SO242/2_205_SLURP-2-holothurian-3	Slurp Gun	2015-09-18T18:24	-7.08273	-88.4706	4188					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP2: scotoplanes pieces go into the slurpgun container 2
SO242/2_205_SLURP-3-holothurian-4	Slurp Gun	2015-09-18T18:27	-7.08269	-88.4706	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PV20: Psychropotidae with slurpgun as transportaion tool to put it in biobox
SO242/2_205_COLBOX-2-holothurian-4	Collector Box	2015-09-18T18:34	-7.08269	-88.4706	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_COLBOX2 Psychropotes in the biobox
SO242/2_205_SLURP-4-holothurian-5	Slurp Gun	2015-09-18T18:40	-7.08269	-88.4707	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP3: scotoplanes slurped in slurpgun container number 3
SO242/2_205_COLBOX-3-holothurian-5	Collector Box	2015-09-18T18:55	-7.08256	-88.4705	4188					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_COLBOX3 scotoplanes in the biobox
SO242/2_205_SLURP-5-holothurian-6	Slurp Gun	2015-09-18T18:57	-7.08257	-88.4704	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP4 small scotoplanes in slurpgun chamber 4
SO242/2_205_COLBOX-4-holothurian-6	Collector Box	2015-09-18T19:05	-7.08258	-88.4703	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_COLBOX4 Psychronaetes in the biobox
SO242/2_205_SLURP-6-holothurian-7	Slurp Gun	2015-09-18T19:10	-7.08255	-88.4703	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP5 munnopsid in the slurpgun chamber 5
SO242/2_205_COLBOX-5-holothurian-7	Collector Box	2015-09-18T19:21	-7.08245	-88.4701	4188					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_COLBOX5 palaeopatides in the biobox

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_205_PUC-21	Push corer	2015-09-18T20:37	-7.08255	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC21, SO242-2_D205_PUC51, SO242-2_D205_PUC71; PC diameter = 7.4 cm
SO242/2_205_PUC-51	Push corer	2015-09-18T20:37	-7.08255	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC21, SO242-2_D205_PUC51, SO242-2_D205_PUC71; PC diameter = 7.4 cm
SO242/2_205_PUC-71	Push corer	2015-09-18T20:37	-7.08255	-88.47	4190					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC21, SO242-2_D205_PUC51, SO242-2_D205_PUC71; PC diameter = 7.4 cm
SO242/2_205_MICP-2-2	Microsensor profiler	2015-09-18T21:12	-7.08271	-88.4698	4189	2015-09-19T00:12	-7.0827	-88.46978	4189	Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_MICP2-2: profiler started with magnet stick (white pile to the side of the track)
SO242/2_205_PUC-48	Push corer	2015-09-18T21:34	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC48 (PCs at the brownish rim of the track where more sediment resettled after the EBS deployment); PC diameter = 7.4 cm
SO242/2_205_PUC-68	Push corer	2015-09-18T21:35	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC68 (PCs at the brownish rim of the track where more sediment resettled after the EBS deployment); PC diameter = 7.4 cm
SO242/2_205_PUC-36	Push corer	2015-09-18T21:36	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC36 (PCs at the brownish rim of the track where more sediment resettled after the EBS deployment); PC diameter = 7.4 cm
SO242/2_205_PUC-31	Push corer	2015-09-18T21:37	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC31 (PCs at the brownish rim of the track where more sediment resettled after the EBS deployment); PC diameter = 7.4 cm
SO242/2_205_PUC-59	Push corer	2015-09-18T21:53	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC59 (Pushcoring at a pile of whitish sediment on the NE side of the track close to chamber 3); PC diameter = 7.4 cm
SO242/2_205_PUC-55	Push corer	2015-09-18T21:53	-7.08291	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_PUC55 (Pushcoring at a pile of whitish sediment on the NE side of the track close to chamber 3); PC diameter = 7.4 cm
SO242/2_205_SLURP-7-isopod-1	Slurp Gun	2015-09-18T23:49	-7.08258	-88.4695	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP6: isopod into slurpe container 6
SO242/2_205_SLURP-8-isopod-2	Slurp Gun	2015-09-19T00:04	-7.08293	-88.4697	4189					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D205_SLURP7: isopod into slurpe container 7
SO242/2_206-1	Ocean Floor Observation System	2015-09-19T05:26	-7.0899	-88.4633	4157	2015-09-19T12:52	-7.0579	-88.44806	4073	Action: max depth/on ground; Position sensor: USBL
SO242/2_207-1	CTD/Rosette	2015-09-19T15:42	-7.08295	-88.4694	-4142					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4130 m

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_208-1	MultiCorer	2015-09-19T22:12	-7.12553	-88.4507	4071					Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length 4180m FW2/SPW2
SO242/2_209-1	CTD/Rosette	2015-09-20T02:16	-7.08305	-88.4694	-4134					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4130 m
SO242/2_211-1	Remote operated vehicle	2015-09-20T15:14	-7.08327	-88.4699	4170	2015-09-20T23:41	-7.0828	-88.46952	4174	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_211_MICP-1-1	Microsensor profiler	2015-09-20T15:38	-7.0831	-88.4694	4188	2015-09-20T18:38	-7.0831	-88.46937	4188	Action: on ground/max depth; Position sensor: USBL; Comment: photo of Profiler 1 placed on sediment (SO242-2_D211_MICP1)
SO242/2_211_BFC-ROV-1	Benthic flux chamber	2015-09-20T16:07	-7.08317	-88.4693	4188	2015-09-21T23:07	-7.0832	-88.4693	4188	Action: on ground/max depth; Position sensor: USBL; Comment: photo of chamber 1 (SO242-2_D211_BFC1), zoom on rings/penetration depth, white ring is visible (10cm?)
SO242/2_211_BFC-ROV-2	Benthic flux chamber	2015-09-20T16:28	-7.08323	-88.4693	4188	2015-09-21T23:28	-7.0832	-88.46925	4188	Action: on ground/max depth; Position sensor: USBL; Comment: photo of chamber 2 (SO242-2_D211_BFC2), white ring is clearly visible and a tiny bit of the underlaying green ring can be seen too
SO242/2_211_BFC-ROV-3	Benthic flux chamber	2015-09-20T16:57	-7.08331	-88.4692	4188	2015-09-22T00:57	-7.0833	-88.46918	4188	Action: on ground/max depth; Position sensor: USBL; Comment: photo of chamber 3 (So242-2_D211_BFC3), green ring (12.5cm) is visible on the side where the foot of chamber was in the air
SO242/2_211_SLURP-1-isopod-1	Slurp Gun	2015-09-20T17:10	-7.08331	-88.4692	4188					Action: on ground/max depth; Position sensor: USBL; Comment: isopod in pot 1 of slurp gun carroussel (SO242-2_D211_SLURP_isopod1)
SO242/2_211_PUC-57	Push corer	2015-09-20T17:23	-7.08278	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PC for geochem: 57 (SO242-2_D211_PUC57) and 73 (SO242-2_D211_PUC73) (both between two nodules); PC diameter = 7.4 cm
SO242/2_211_PUC-73	Push corer	2015-09-20T17:23	-7.08278	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PC for geochem: 57 (SO242-2_D211_PUC57) and 73 (SO242-2_D211_PUC73) (both between two nodules); PC diameter = 7.4 cm
SO242/2_211_PUC-17	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-26	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-35	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_211_PUC-37	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-52	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-60	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-65	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-74	Push corer	2015-09-20T17:54	-7.08264	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37
SO242/2_211_PUC-25	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.
SO242/2_211_PUC-32	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.
SO242/2_211_PUC-33	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.
SO242/2_211_PUC-5	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_211_PUC-69	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.
SO242/2_211_PUC-76	Push corer	2015-09-20T18:24	-7.08256	-88.4699	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track; PC diameter = 7.
SO242/2_211_MICP-1-2	Microsensor profiler	2015-09-20T18:53	-7.08331	-88.4692	4188	2015-09-20T21:47	-7.0833	-88.46918	4188	Action: on ground/max depth; Position sensor: USBL; Comment: profiler switched on
SO242/2_211_COLBOX-1-sponge-1	Collector Box	2015-09-20T19:18	-7.08373	-88.4689	4189					Action: on ground/max depth; Position sensor: USBL; Comment: photo of sponge and biobox (SO242-2_D211_COLBOX_sponge1)
SO242/2_211_COLBOX-2-sponge-2	Collector Box	2015-09-20T19:40	-7.08387	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: sampling sponge into biobox (SO242-2_D211_COLBOX_sponge2)
SO242/2_211_KIPS-A	KIPS bottle	2015-09-20T19:56	-7.08385	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: KIPS bottle A is closed now (SO242-2_D211_KIPS-A) (pumped volume : 2L, sample volume at the end 500mL)
SO242/2_211_KIPS-B	KIPS bottle	2015-09-20T20:03	-7.08385	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: closing bottle B (SO242-2_D211_KIPS-B) (problem with KIPS: during closing of bottle B signal was lost)
SO242/2_211_SLURP-2-peniagone-1	Slurp Gun	2015-09-20T21:03	-7.08346	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: peniagone in chamber 2 (SO242-2_D211_SLURP_peniagone1)
SO242/2_211_COLBOX-3-holothurian-1	Collector Box	2015-09-20T21:09	-7.08349	-88.4698	4189					Action: on ground/max depth; Position sensor: USBL; Comment: holo slurped and put in biobox (SO242-2_D211_COLBOX_holothurian1)
SO242/2_211_SLURP-3-isopod-2	Slurp Gun	2015-09-20T21:19	-7.08353	-88.4696	4189					Action: on ground/max depth; Position sensor: USBL; Comment: isopod slurped in chamber 3 (SO242-2_D211_SLURP_isopod2)
SO242/2_211_SLURP-4-peniagine-2	Slurp Gun	2015-09-20T21:26	-7.08348	-88.4694	4189					Action: on ground/max depth; Position sensor: USBL; Comment: peniagone probably in chamber 4 (SO242-2_D211_SLURP_peniagone2)
SO242/2_211_SLURP-5-isopod-3	Slurp Gun	2015-09-20T21:30	-7.08338	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: photo of isopod (in chamber 5) (SO242-2_D211_SLURP_isopod3)
SO242/2_211_MICP-1-3	Microsensor profiler	2015-09-20T21:49	-7.08331	-88.4692	4188	2015-09-21T15:49	-7.0833	-88.46918	4188	Action: on ground/max depth; Position sensor: USBL; Comment: Prof 1 moved 1m and placed again
SO242/2_212-1	Ocean Floor Observation System	2015-09-21T01:12	-7.09302	-88.4571	4078	2015-09-21T09:48	-7.0596	-88.45767	4121	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4145m
SO242/2_213-1	Remote operated vehicle	2015-09-21T15:08	-7.0833	-88.4692	4182	2015-09-22T03:15	-7.0838	-88.46924	4185	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_213_SCOOP-1-nodule-1	Scoop/Biobox	2015-09-21T15:34	-7.0837	-88.4692	4189					Action: on ground/max depth; Position sensor: USBL; Comment: remove both nodules with scoop: SO242-2_D213_nodule-x (x = 1,2)
SO242/2_213_SCOOP-2-nodule-2	Scoop/Biobox	2015-09-21T15:34	-7.0837	-88.4692	4189					Action: on ground/max depth; Position sensor: USBL; Comment: remove both nodules with scoop: SO242-2_D213_nodule-x (x = 1,2)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_213_MICP-2-1	Microsensor profiler	2015-09-21T16:02	-7.0837	-88.4692	4189	2015-09-21T20:02	-7.0837	-88.46921	4189	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 2 placed and started: SO242-2_D213_MICP2-1
SO242/2_213_MICP-1-1	Microsensor profiler	2015-09-21T16:23	-7.08339	-88.469	4188	2015-09-21T19:41	-7.0834	-88.46904	4188	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 1 placed in EBS track: SO242-2_D213_MICP1-1
SO242/2_213_COLBOX-1-litter-1	Collector Box	2015-09-21T17:59	-7.07943	-88.4679	4179					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of sampled plastic bag; litter is stored in Biobox: SO242-2_D213_Plastic
SO242/2_213_NIS-1	Bottle, Niskin 5-L	2015-09-21T18:40	-7.07966	-88.4682	4178					Action: on ground/max depth; Position sensor: USBL; Comment: left Niskin bottle is fired: SO242-2_D213_NIS1 (sediment plume experiment)
SO242/2_213_NIS-2	Bottle, Niskin 5-L	2015-09-21T18:57	-7.07974	-88.4683	4179					Action: on ground/max depth; Position sensor: USBL; Comment: middle Niskin bottle is fired: SO242-2_D213_NIS2 (~2 min after ROV had whirled up new sediment from ist porch) (sediment plume experiment)
SO242/2_213_NIS-3	Bottle, Niskin 5-L	2015-09-21T19:05	-7.07975	-88.4684	4179					Action: on ground/max depth; Position sensor: USBL; Comment: right Niskin is fired: SO242-2_D213_NIS3 (sediment plume experiment)
SO242/2_213_MICP-1-2	Microsensor profiler	2015-09-21T19:50	-7.08288	-88.4687	4187	2015-09-22T00:38	-7.0829	-88.46873	4187	Action: on ground/max depth; Position sensor: USBL; Comment: Profiler 1 started with magnetic stick: SO242-2_D213_MICP1-2 (inside EBS track)
SO242/2_213_MICP-2-2	Microsensor profiler	2015-09-21T20:12	-7.0839	-88.4691	4189	2015-09-22T01:30	-7.0839	-88.46913	4189	Action: on ground/max depth; Position sensor: USBL; Comment: Close-up photo of sensors above seafloor; Profiler 2 started: SO242-2_D213_MICP2-2 (undisturbed seafloor outside EBS track)
SO242/2_213_PUC-75	Push corer	2015-09-21T20:19	-7.0839	-88.4691	4189					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of slightly tilted push core: SO242-2_D213_PUC75 (push coring for Xray next to Profiler 2); PC diameter = 7.4 cm
SO242/2_213_PUC-58	Push corer	2015-09-21T21:13	-7.08289	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 58,72,81) (push coring in bezel print of BFC-CUBE-#3); PC diameter = 7.4 cm
SO242/2_213_PUC-72	Push corer	2015-09-21T21:13	-7.08289	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 58,72,81) (push coring in bezel print of BFC-CUBE-#3); PC diameter = 7.4 cm
SO242/2_213_PUC-81	Push corer	2015-09-21T21:13	-7.08289	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 58,72,81) (push coring in bezel print of BFC-CUBE-#3); PC diameter = 7.4 cm
SO242/2_213_BCROV-2	Blade core	2015-09-21T21:17	-7.08289	-88.4693	4189					Action: on ground/max depth; Position sensor: USBL; Comment: Bladecorer 2 is pushed into the sediment: SO242-2_D213_XXX2 (in bezel print of BFC-CUBE-#3); BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_213_PUC-20	Push corer	2015-09-21T22:09	-7.08286	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 20,53,67) (push coring in bezel print of BFC-CUBE-#2); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_213_PUC-53	Push corer	2015-09-21T22:09	-7.08286	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 20,53,67) (push coring in bezel print of BFC-CUBE-#2); PC diameter = 7.4 cm
SO242/2_213_PUC-67	Push corer	2015-09-21T22:09	-7.08286	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 20,53,67) (push coring in bezel print of BFC-CUBE-#2); PC diameter = 7.4 cm
SO242/2_213_BCROV-1	Blade core	2015-09-21T22:13	-7.08286	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Bladecorer 1 is pushed into the sediment: SO242-2_D213_XXX1 (in bezel print of BFC-CUBE-#3); BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_213_PUC-46	Push corer	2015-09-21T22:22	-7.08286	-88.4693	4188					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push core 46: SO242-2_D213_PUC46 (push coring the sediment outside the bezel print); PC diameter = 7.4 cm
SO242/2_213_BCROV-4	Blade core	2015-09-22T00:19	-7.08324	-88.4698	4190					Action: on ground/max depth; Position sensor: USBL; Comment: push Bladecorer 4 into sediment and trigger it: SO242-2_D213_XXX4 (above undisturbed sediment area); BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_213_PUC-10	Push corer	2015-09-22T00:24	-7.08324	-88.4698	4190					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 10,61,79); PC diameter = 7.4 cm
SO242/2_213_PUC-61	Push corer	2015-09-22T00:24	-7.08324	-88.4698	4190					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 10,61,79); PC diameter = 7.4 cm
SO242/2_213_PUC-79	Push corer	2015-09-22T00:24	-7.08324	-88.4698	4190					Action: on ground/max depth; Position sensor: USBL; Comment: Photo of push cores: SO242-2_D213_PUCx (x = 10,61,79); PC diameter = 7.4 cm
SO242/2_214-1	Boomerang-Lot	2015-09-22T03:49	-7.12875	-88.4521	4148	2015-09-25T13:31	-7.1331	-88.45863	4173	Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: Chamber-Lander (POLIRIS)
SO242/2_210-1	Remote operated vehicle elevator	2015-09-22T04:56	-7.08343	-88.4701	4130					Action: hoisting; Position sensor: Ship-mounted DGPS; Comment: released
SO242/2_215-1	Benthic Crawler	2015-09-22T13:08	-7.12553	-88.4507	4127					Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4153m
SO242/2_216-1	Remote operated vehicle	2015-09-22T16:36	-7.12537	-88.4505	4169	2015-09-23T05:06	-7.1248	-88.45064	4124	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_216_BCRAWL	Benthic Crawler	2015-09-22T16:44	-7.12552	-88.4506	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Observing crawler at seafloor, it moved 10m as planned
SO242/2_216_PV-1	Photo/Video	2015-09-22T17:01	-7.12538	-88.4507	4197	2015-09-22T17:08	-7.1254	-88.45066	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 22.09.2015 17:14:46)
SO242/2_216_MICP-2-1	Microsensor profiler	2015-09-22T17:07	-7.12538	-88.4507	4198	2015-09-22T20:19	-7.1254	-88.45066	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: MICP 2-1 (Profiler 2-1) placed above nodule removal spot and started
SO242/2_216_PV-2	Photo/Video	2015-09-22T17:14	-7.12547	-88.4507	4192	2015-09-22T17:28	-7.1256	-88.45059	4197	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On for crawler observation (until 22.09.2015 17:28:07)
SO242/2_216_PUC-13	Push corer	2015-09-22T17:58	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC13 EXP-4 (Experimental core Control 1); PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_216_PUC-83	Push corer	2015-09-22T17:58	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC83 EXP-4 (Experimental core Control 1); PC diameter = 7.4 cm
SO242/2_216_PUC-5	Push corer	2015-09-22T18:29	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC5 (Experimental core Control 2); PC diameter = 7.4 cm
SO242/2_216_PUC-2	Push corer	2015-09-22T18:32	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC22 (Experimental core Control 2); PC diameter = 7.4 cm
SO242/2_216_PUC-12	Push corer	2015-09-22T18:33	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC12 (Experimental core Control 3); PC diameter = 7.4 cm
SO242/2_216_PUC-62	Push corer	2015-09-22T18:35	-7.12514	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC62 (Experimental core Control 3); PC diameter = 7.4 cm
SO242/2_216_Marker-1	Marker	2015-09-22T18:55	-7.12514	-88.4503	4196					Action: on ground/max depth; Position sensor: USBL; Comment: Marker 1 retrieved in port ROV drawer
SO242/2_216_PUC-37	Push corer	2015-09-22T19:31	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC37 (Experimental core SD2); PC diameter = 7.4 cm
SO242/2_216_PUC-32	Push corer	2015-09-22T19:34	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC32 (Experimental core SD2); PC diameter = 7.4 cm
SO242/2_216_PUC-14	Push corer	2015-09-22T19:36	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC14 (Experimental core SD3) ; PC diameter = 7.4 cm
SO242/2_216_PUC-34	Push corer	2015-09-22T19:38	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC34 (Experimental core SD3) ; PC diameter = 7.4 cm
SO242/2_216_PUC-47	Push corer	2015-09-22T19:59	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC47 (Experimental core SD1) ; PC diameter = 7.4 cm
SO242/2_216_PUC-25	Push corer	2015-09-22T20:00	-7.12519	-88.4503	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC25 (Experimental core SD1) ; PC diameter = 7.4 cm
SO242/2_216_SCOOP-1_nodule-1	Scoop/Biobox	2015-09-22T20:25	-7.12584	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_Nodule1
SO242/2_216_SCOOP-2_nodule-2	Scoop/Biobox	2015-09-22T20:27	-7.12584	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_Nodule2
SO242/2_216_SCOOP-3_nodule-3	Scoop/Biobox	2015-09-22T20:29	-7.12584	-88.4508	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_Nodule3
SO242/2_216_MICP-2-2	Microsensor profiler	2015-09-22T20:42	-7.12584	-88.4508	4198	2015-09-22T22:54	-7.1258	-88.45082	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: MICP-2-2 started
SO242/2_216_PUC-35	Push corer	2015-09-22T20:56	-7.12538	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC35; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_216_PUC-40	Push corer	2015-09-22T20:57	-7.12538	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC40; PC diameter = 7.4 cm
SO242/2_216_PUC-69	Push corer	2015-09-22T20:58	-7.12538	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC69; PC diameter = 7.4 cm
SO242/2_216_PUC-65	Push corer	2015-09-22T20:58	-7.12538	-88.4511	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_D216_PUC65; PC diameter = 7.4 cm
SO242/2_216_COLBOX-1-holothurian-1	Collector Box	2015-09-22T21:26	-7.12577	-88.4509	4197					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_COLBOX1 (Senckenberg biobox) Holothurian, species unknown
SO242/2_216_NET-1-holothurian-1	Net	2015-09-22T21:58	-7.12637	-88.4507	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_NET1, Benthodytes holothurian in handnet in port ROV drawer, was lost during ascent
SO242/2_216_SLURP-1-crab	Slurp Gun	2015-09-22T22:14	-7.12634	-88.4506	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_SLURP2, crab with anemone
SO242/2_216_SLURP-2-isopod	Slurp Gun	2015-09-22T22:15	-7.12636	-88.4506	4200					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_SLURP3, Isopod
SO242/2_216_SLURP-3-peniagone	Slurp Gun	2015-09-22T22:17	-7.12635	-88.4506	4199					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_SLURP4, Peniagone holothurian
SO242/2_216_SLURP-4-holothurian	Slurp Gun	2015-09-22T22:23	-7.12609	-88.4506	4198					Action: on ground/max depth; Position sensor: USBL; Comment: SO242-2_216_SLURP6, Holothurian
SO242/2_216_PV-3	Photo/Video	2015-09-22T22:37	-7.12563	-88.4506	4197	2015-09-22T22:39	-7.1256	-88.45059	4198	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 22.09.2015 22:39:23)
SO242/2_217-1	Remote operated vehicle elevator	2015-09-23T10:30	-7.07803	-88.458	4149					Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight, Cable Length 4164m
SO242/2_218-1	Remote operated vehicle elevator	2015-09-23T14:50	-7.07805	-88.4579	4144					Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length 4157m
SO242/2_219-1	Remote operated vehicle	2015-09-23T18:05	-7.07808	-88.4581	4170	2015-09-24T03:24	-7.0787	-88.45798	4172	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_219_MICP-1-1	Microsensor profiler	2015-09-23T18:34	-7.07822	-88.4576	4194	2015-09-23T20:46	-7.0782	-88.45757	4194	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 1 positioned on less tilted position on white area in the wide track and activated with magnet bar
SO242/2_219_PV-1	Photo/Video	2015-09-23T19:33	-7.07846	-88.4576	4194	2015-09-23T19:43	-7.0784	-88.4575	4191	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 23.09.2015 19:43:07)
SO242/2_219_BFC-ROV-1	Microsensor profiler	2015-09-23T19:37	-7.07846	-88.4576	4194	2015-09-23T22:23	-7.0785	-88.45756	4194	Action: on ground/max depth; Position sensor: USBL; Comment: positioning the chamber on whitish sediments very close to the porch
SO242/2_219_MICP-2-1	Microsensor profiler	2015-09-23T19:47	-7.07812	-88.4579	4193	2015-09-23T22:26	-7.0781	-88.45785	4193	Action: on ground/max depth; Position sensor: USBL; Comment: starting profiler 2-1
SO242/2_219_PV-2	Photo/Video	2015-09-23T19:53	-7.07846	-88.4576	4193	2015-09-23T20:03	-7.0785	-88.45756	4190	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 23.09.2015 20:03:01)
SO242/2_219_BFC-ROV-2	Benthic flux chamber	2015-09-23T20:26	-7.07822	-88.4576	4193	2015-09-24T23:36	-7.0782	-88.45757	4193	Action: on ground/max depth; Position sensor: USBL; Comment: positioning the chamber over the valley with snowshoes perpendicular to the crests

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_219_MICP-1-2	Microsensor profiler	2015-09-23T20:56	-7.07822	-88.4576	4193	2015-09-24T01:20	-7.0782	-88.45757	4193	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 1 activated on spot prof 1-2
SO242/2_219_PUC-70	Push corer	2015-09-23T21:08	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #70 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-51	Push corer	2015-09-23T21:10	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #51 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-21	Push corer	2015-09-23T21:13	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #21 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-58	Push corer	2015-09-23T21:16	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #58 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-10	Push corer	2015-09-23T21:17	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #10 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-36	Push corer	2015-09-23T21:18	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #36 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-20	Push corer	2015-09-23T21:20	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #20 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-67	Push corer	2015-09-23T21:22	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #67 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-79	Push corer	2015-09-23T21:24	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #79 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-28	Push corer	2015-09-23T21:25	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #28 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-61	Push corer	2015-09-23T21:26	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #61 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-77	Push corer	2015-09-23T21:28	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #77 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-48	Push corer	2015-09-23T21:33	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #48 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-30	Push corer	2015-09-23T21:36	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #30 taken on white patch; PC diameter = 7.4 cm
SO242/2_219_PUC-75	Push corer	2015-09-23T21:41	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #75 taken in valley; PC diameter = 7.4 cm
SO242/2_219_PUC-68	Push corer	2015-09-23T21:42	-7.07822	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #68 taken in valley; PC diameter = 7.4 cm
SO242/2_219_MICP-2-2	Microsensor profiler	2015-09-23T22:37	-7.07866	-88.458	4192	2015-09-24T01:43	-7.0787	-88.45801	4192	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 2 at spot prof 2-2 positioned and started
SO242/2_219_BFC-CUBE-3	Benthic flux chamber	2015-09-23T23:12	-7.07831	-88.4579	4192	2015-09-27T19:22	-7.0783	-88.45788	4192	Action: on ground/max depth; Position sensor: USBL; Comment: photo of Cube 3
SO242/2_219_BFC-CUBE-2	Benthic flux chamber	2015-09-23T23:43	-7.07743	-88.4576	4193	2015-09-27T17:34	-7.0774	-88.45761	4193	Action: on ground/max depth; Position sensor: USBL; Comment: photo of Cube 2 with encaged Scotoplanes sp.

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_219_SLURP-1-palaeopatides-1	Slurp Gun	2015-09-24T00:04	-7.07787	-88.458	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Palaeopatides sp. sampled with suction pump
SO242/2_219_ISCHAM-BICS-4-palaeopatides-1	In situ incubation chamber	2015-09-24T00:09	-7.07809	-88.4581	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Palaeopatides sp. delivered to BICS chamber 4 on elevator 2
SO242/2_219_SLURP-2-palaeopatides-2	Slurp Gun	2015-09-24T00:21	-7.0785	-88.458	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Orange Palaeopatides sp. sampled with suction pump
SO242/2_219_ISCHAM-BICS-3-palaeopatides-2	In situ incubation chamber	2015-09-24T00:25	-7.07809	-88.4581	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Orange Palaeopatides sp. delivered to BICS chamber 3
SO242/2_219_SLURP-3-benthodytes-1	Slurp Gun	2015-09-24T00:31	-7.07803	-88.458	4193					Action: on ground/max depth; Position sensor: USBL; Comment: Benthodytes sp. sampled with suction pump and delivered to Senckenberg biobox
SO242/2_219_ISCHAM-BICS-1-benthodytes-1	In situ incubation chamber	2015-09-24T00:41	-7.07809	-88.4581	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Benthothuria sp. delivered to BICS chamber 1
SO242/2_219_COLBOX-1-holothurian-1	Collector Box	2015-09-24T00:50	-7.07809	-88.4581	4193					Action: on ground/max depth; Position sensor: USBL; Comment: unknown holothurian species sampled with handnet and delivered to Senckenbeg biobox
SO242/2_219_SLURP-4-peniagone-1	Slurp Gun	2015-09-24T00:58	-7.07759	-88.4581	4193					Action: on ground/max depth; Position sensor: USBL; Comment: Peniagone sampled with suction pump
SO242/2_219_ISCHAM-BICS-2-peniagone-1	In situ incubation chamber	2015-09-24T01:01	-7.07784	-88.4581	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Peniagone delivered to BICS chamber 2
SO242/2_219_MICP-1-3	Microsensor profiler	2015-09-24T01:33	-7.07812	-88.4575	4193	2015-09-24T17:51	-7.0781	-88.45753	4193	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 1 positioned on spot prof 1-3 and activated (until 24.09.2015 17:51:30)
SO242/2_219_PV-3	Photo/Video	2015-09-24T01:35	-7.07812	-88.4575	4193	2015-09-24T01:37	-7.0781	-88.45753	4193	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 24.09.2015 01:35:28)
SO242/2_219_PV-4	Photo/Video	2015-09-24T01:37	-7.07812	-88.4575	4193	2015-09-24T01:41	-7.0787	-88.45801	4192	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 24.09.2015 01:41:57)
SO242/2_219_MICP-2-3	Microsensor profiler	2015-09-24T01:46	-7.07866	-88.458	4192	2015-09-24T18:14	-7.0787	-88.45801	4192	Action: on ground/max depth; Position sensor: USBL; Comment: profiler 2 positioned at spot prof 2-3 (until 24.09.2015 18:14:24)
SO242/2_220-1	Ocean Floor Observation System	2015-09-24T05:23	-7.12917	-88.4327	4159	2015-09-24T12:21	-7.096	-88.41376	4173	Action: max depth/on ground; Position sensor: USBL
SO242/2_221-1	Boomerang-Lot	2015-09-24T13:19	-7.00218	-88.4425	3884	2015-09-29T04:37	-7.0032	-88.4406	3844	Action: in the water; Position sensor: Ship-mounted DGPS; Comment: Deep Sea Oberservatory System (DOS)-Lander (GEOMAR); abandoned (did not release at recovery)
SO242/2_222-1	Remote operated vehicle	2015-09-24T16:29	-7.0784	-88.4577	4174	2015-09-25T02:35	-7.0783	-88.45779	4189	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_222_BFC-ROV-3	Benthic flux chamber	2015-09-24T17:00	-7.07839	-88.4576	4194	2015-09-27T17:00	-7.0784	-88.45759	4194	Action: on ground/max depth; Position sensor: USBL; Comment: START OF MEASUREMENT: SO242-2_D222_BFC3 (ROV chamber 3 of MPI/AWI)
SO242/2_222_MICP-1-1	Microsensor profiler	2015-09-24T18:08	-7.07807	-88.4575	4194	2015-09-24T20:31	-7.0781	-88.45751	4194	Action: on ground/max depth; Position sensor: USBL; Comment: START OF MEASUREMENT: SO242-2_D222_MICP_1-1 (ROV profiler 1 of MPI/AWI, first measurement) (until 24.09.2015 20:31:12)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_222_MICP-2-1	Microsensor profiler	2015-09-24T18:29	-7.07841	-88.4584	4192	2015-09-24T21:30	-7.0784	-88.45839	4192	Action: on ground/max depth; Position sensor: USBL; Comment: START OF MEASUREMENT: SO242-2_D222_MICP_2-1 (ROV profiler 2 of MPI/AWI, first measurement) (until 24.09.2015 21:30:04)
SO242/2_222_PUC-40	Push corer	2015-09-24T19:04	-7.07818	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC40 (3 push cores for meiofauna in white patch collected); PC diameter = 7.4 cm
SO242/2_222_PUC-62	Push corer	2015-09-24T19:04	-7.07818	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC62 (3 push cores for meiofauna in white patch collected); PC diameter = 7.4 cm
SO242/2_222_PUC-83	Push corer	2015-09-24T19:04	-7.07818	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC83 (3 push cores for meiofauna in white patch collected); PC diameter = 7.4 cm
SO242/2_222_PUC-22	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC22 (good) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-25	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC25 (good) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-5	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC5 in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-65	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC65 (only half full) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-12	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC12 (good) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-37	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC37 (half full, surface whirled up) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-47	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC47 (good) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-24	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC24 in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-35	Push corer	2015-09-24T20:02	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC35 (long) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-34	Push corer	2015-09-24T20:09	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC34 in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-46	Push corer	2015-09-24T20:09	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC46 (very long, put into drawer without outer case; case was lost earlier) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_PUC-14	Push corer	2015-09-24T20:09	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC14 (short) in ripple valley; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_222_PUC-13	Push corer	2015-09-24T20:09	-7.0782	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_PUC13 (very long) in ripple valley; PC diameter = 7.4 cm
SO242/2_222_COLBOX-1a-nodule-1	Collector Box	2015-09-24T21:01	-7.07799	-88.4578	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_COLBOX1A (Biobox Senckenberg, polymetallic nodule), collected with scoop
SO242/2_222_COLBOX-1b-nodule-2	Collector Box	2015-09-24T21:01	-7.07799	-88.4578	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_D222_COLBOX1B (Biobox Senckenberg, polymetallic nodule), collected with scoop
SO242/2_222_MICP-1-2	Microsensor profiler	2015-09-24T21:04	-7.07799	-88.4578	4194	2015-09-24T23:59	-7.078	-88.45778	4194	Action: on ground/max depth; Position sensor: USBL; Comment: START OF MEASUREMENT: SO242-2_D222_MICP_1-2 (ROV profiler 1 of MPI/AWI, second measurement) (until 24.09.2015 23:59:14)
SO242/2_222_MICP-2-2	Microsensor profiler	2015-09-24T21:37	-7.07828	-88.4581	4192	2015-09-24T00:43	-7.0783	-88.45805	4192	Action: on ground/max depth; Position sensor: USBL; Comment: START OF MEASUREMENT: SO242-2_D222_MICP_2-2 (ROV profiler 2 of MPI/AWI, second measurement) (until 25.09.2015 00:43:30)
SO242/2_222_COLBOX-2-ophiurid-1	Collector Box	2015-09-24T21:45	-7.07812	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX2 (Biobox Senckenberg, ophiuroid), collected with manipulator
SO242/2_222_COLBOX-3-amphipods-1	Collector Box	2015-09-24T21:49	-7.07807	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLES: SO242-2_COLBOX3A; SAMPLE: SO242-2_COLBOX3B (Biobox Senckenberg, 2 amphipods), collected with slurpgun
SO242/2_222_COLBOX-4-probeebei-1	Collector Box	2015-09-24T22:01	-7.07812	-88.4576	4192					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX4 (Biobox Senckenberg, Probeebei), collected with slurpgun
SO242/2_222_COLBOX-5-worm-1	Collector Box	2015-09-24T22:07	-7.07792	-88.4577	4193					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX5 (Biobox Senckenberg, Unknown worm), collected with slurpgun
SO242/2_222_SLURP-1-isopod-1	Slurp Gun	2015-09-24T22:13	-7.07803	-88.4578	4193					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_SLURP1 (slurpgun container #1, isopod)
SO242/2_222_COLBOX-6-ophiurid-2	Collector Box	2015-09-24T22:34	-7.07751	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX6 (Biobox Senckenberg, ophiuroid) collected with ROV manipulator
SO242/2_222_SLURP-2-isopod-2	Slurp Gun	2015-09-24T22:40	-7.07787	-88.4574	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_SLURP2 (slurpgun container #2, isopod)
SO242/2_222_SLURP-3-isopod-3	Slurp Gun	2015-09-24T22:43	-7.07778	-88.4576	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_SLURP3 (slurpgun container #3, isopod)
SO242/2_222_COLBOX-7-sponge-1	Collector Box	2015-09-24T22:44	-7.07782	-88.4577	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX7 (Biobox Senckenberg, sponge that had isopode inside), collected with slurpgun

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_222_COLBOX-8-crinoid-1	Collector Box	2015-09-24T22:54	-7.07758	-88.4578	4194					Action: on ground/max depth; Position sensor: USBL; Comment: SAMPLE: SO242-2_COLBOX8 (Biobox Senckenberg, Crinoid on polymetallic nodule), collected with scoop
SO242/2_223-1	Ocean Floor Observation System	2015-09-25T05:16	-7.0801	-88.4703	4125	2015-09-25T11:21	-7.0846	-88.44494	4144	Action: max depth/on ground; Position sensor: USBL
SO242/2_224-1	CTD/Rosette	2015-09-25T16:25	-7.12257	-88.4033	-4202					Action: max depth/on ground; Position sensor: Ship-mounted DGPS; Comment: max. Cable Length: 4190 m
SO242/2_225-1	Boomerang-Lot	2015-09-25T18:56	-7.0659	-88.4516	4145	2015-09-28T06:36	-7.0659	-88.45157	4145	Action: max depth/on ground; Position sensor: USBL; Comment: Chamber & Profiler-Lander 1 (AWI/MPI), Bottom Sight, Cable Length 4159m
SO242/2_226-1	Boomerang-Lot	2015-09-25T23:35	-7.07817	-88.4565	4148	2015-09-29T11:38	-7.0782	-88.45648	4148	Action: max depth/on ground; Position sensor: USBL; Comment: Chamber-Lander (POLIRIS), max. Cable Length: 4163m
SO242/2_227-1	Ocean Floor Observation System	2015-09-26T05:18	-7.07732	-88.4693	4129	2015-09-26T11:19	-7.076	-88.43638	4186	Action: max depth/on ground; Position sensor: Ship-mounted DGPS
SO242/2_228-1	Remote operated vehicle elevator	2015-09-26T14:57	-7.078	-88.458	4117					Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length: 4164m
SO242/2_229-1	MultiCorer	2015-09-26T18:23	-7.0783	-88.457	4106					Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length: 4184m
SO242/2_231-1	Ocean Floor Observation System	2015-09-27T02:42	-7.06538	-88.5386	4117	2015-09-27T12:29	-7.1064	-88.51755	4083	Action: max depth/on ground; Position sensor: USBL; Comment: Bottom Sight at Cable Length: 4130m
SO242/2_232-1	Remote operated vehicle	2015-09-27T15:33	-7.078	-88.4581	4168	2015-09-27T23:34	-7.0781	-88.45794	4134	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_232_BFC-ROV-1	Benthic flux chamber	2015-09-27T16:06	-7.07802	-88.4579	4193	2015-09-27T21:30	-7.078	-88.45791	4193	Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Chamber 1 (placed on D232) close up, penetration depth 10 cm (placed on ref with nodule)
SO242/2_232_BFC-ROV-4	Benthic flux chamber	2015-09-27T16:27	-7.07824	-88.4578	4194	2015-09-27T21:45	-7.0782	-88.45777	4194	Action: on ground/max depth; Position sensor: USBL; Comment: Chamber 4-1 D232 placed (Ripple in track to place Chamber 4)
SO242/2_232_BFC-ROV-3	Benthic flux chamber	2015-09-27T16:50	-7.07837	-88.4575	4192					Action: on ground/max depth; Position sensor: USBL; Comment: Chamber 3 D219 - white spot on ripple crest, about to recover and secure on elevator1
SO242/2_232_PV-1	Photo/Video	2015-09-27T17:21	-7.07745	-88.4576	4194	2015-09-27T17:53	-7.0776	-88.45759	4192	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 27.09.2015 17:53:49)
SO242/2_232_PUC-32	Push corer	2015-09-27T17:38	-7.07745	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #32 (Sediment imprint of CUBE2); PC diameter = 7.4 cm
SO242/2_232_PUC-40	Push corer	2015-09-27T17:39	-7.07745	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #40 (Sediment imprint of CUBE2); PC diameter = 7.4 cm
SO242/2_232_PUC-62	Push corer	2015-09-27T17:40	-7.07745	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #62 (Sediment imprint of CUBE2); PC diameter = 7.4 cm
SO242/2_232_BCROV-3	Blade core	2015-09-27T17:43	-7.07745	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Bladecore #3 in sediment (Sediment imprint of CUBE2); BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_232_PV-2	Photo/Video	2015-09-27T18:19	-7.07832	-88.4579	4194	2015-09-27T20:01	-7.0783	-88.45762	4192	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 27.09.2015 20:01:07)

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_232_PUC-68	Push corer	2015-09-27T18:55	-7.07832	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #68 (Sediment imprint of CUBE3); PC diameter = 7.4 cm
SO242/2_232_PUC-75	Push corer	2015-09-27T18:56	-7.07832	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #75 (Sediment imprint of CUBE3); PC diameter = 7.4 cm
SO242/2_232_BCROV-4	Blade core	2015-09-27T18:59	-7.07832	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: Bladecore 4 taken with ophiuroid that was in the cube during the 4 days of incubation (Sediment imprint of CUBE3); BCROV dimensions: lengh=20 cm, width=9 cm; height=30 cm
SO242/2_232_PUC-83	Push corer	2015-09-27T19:00	-7.07832	-88.4579	4194					Action: on ground/max depth; Position sensor: USBL; Comment: PUC #83 (Sediment imprint of CUBE3); PC diameter = 7.4 cm
SO242/2_232_PV-3	Photo/Video	2015-09-27T20:08	-7.07813	-88.4576	4195	2015-09-27T20:29	-7.0781	-88.45759	4195	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 27.09.2015 20:29:52)
SO242/2_232_PUC-36	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-50	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-53	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-66	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-71	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-72	Push corer	2015-09-27T20:14	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs #71, #50, #36, #53, #66, #72 (sixpack) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-14	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-23	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-51	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-52	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm

Event label	Device	Date/ Time start	Latitude start	Longitude start	Elevation start	Date/ Time end	Latitude end	Longitude end	Elevation end	Comment
SO242/2_232_PUC-59	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-64	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-70	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-77	Push corer	2015-09-27T20:26	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling) on ripple crest; PC diameter = 7.4 cm
SO242/2_232_PUC-49	Push corer	2015-09-27T20:29	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: PUC sampling valley core #49, #65 (both from drawer) in valley; PC diameter = 7.4 cm
SO242/2_232_PUC-65	Push corer	2015-09-27T20:29	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: PUC sampling valley core #49, #65 (both from drawer) in valley; PC diameter = 7.4 cm
SO242/2_232_PUC-17	Push corer	2015-09-27T21:03	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Two cores on the crest (= right crest from the previous sampling): #17 (right crest), #74 (left crest); PC diameter = 7.4 cm
SO242/2_232_PUC-74	Push corer	2015-09-27T21:03	-7.07813	-88.4576	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Two cores on the crest (= right crest from the previous sampling): #17 (right crest), #74 (left crest); PC diameter = 7.4 cm
SO242/2_232_PV-4	Photo/Video	2015-09-27T21:07	-7.07813	-88.4576	4194	2015-09-27T21:17	-7.0781	-88.45767	4192	Action: on ground/max depth; Position sensor: USBL; Comment: Lower HD rec. On (until 27.09.2015_21:17:54)
SO242/2_232_PUC-56	Push corer	2015-09-27T21:12	-7.078	-88.4575	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Push cores #56 and #82 on white patch; PC diameter = 7.4 cm
SO242/2_232_PUC-82	Push corer	2015-09-27T21:12	-7.078	-88.4575	4195					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Push cores #56 and #82 on white patch; PC diameter = 7.4 cm
SO242/2_232_SCOOP-1-nodule-1	Scoop/Biobox	2015-09-27T21:32	-7.07795	-88.458	4194					Action: on ground/max depth; Position sensor: USBL; Comment: nodule scooped up, goes to bio box
SO242/2_232_COLBOX-1-nodule-1	Collector Box	2015-09-27T21:32	-7.07795	-88.458	4194					Action: on ground/max depth; Position sensor: USBL; Comment: Photo: Nodule in scoop, chamber 1-1 D232
SO242/2_233-1	Ocean Floor Observation System	2015-09-28T08:39	-7.07275	-88.4668	4131	2015-09-28T12:54	-7.0785	-88.4525	4131	Action: max depth/on ground; Position sensor: USBL; Comment: max. Cable Length: 4145m
SO242/2_234-1	Mooring	2015-09-28T14:28	-7.12248	-88.4033	4180					Action: released; Position sensor: Ship-mounted DGPS; Comment: Recovery Thermistor-Mooring (SO242-1_12-1)
SO242/2_235-1	Remote operated vehicle	2015-09-28T22:54	-7.00142	-88.4419	3861	2015-09-29T05:00	-7.0022	-88.44183	3666	Action: max depth/on ground; Position sensor: USBL, ROV KIEL 6000
SO242/2_236-1	Ocean Floor Observation System	2015-09-29T07:17	-7.08918	-88.4462	4136	2015-09-29T10:07	-7.0891	-88.4461	4133	Action: max depth/on ground; Position sensor: USBL; Comment: Recovery MAPR (SO242-1_133-1)
SO242/2_237-1	KONGSBERG EM122	2015-09-29T11:41	-7.0801	-88.4571	4140	2015-09-30T09:00	-5.3893	-84.73162	3987	Action: station start/station end; Position sensor: Ship-mounted DGPS

11.C. Profiles / Profile

S Roeßler

11.C.1. PHF Profiles.

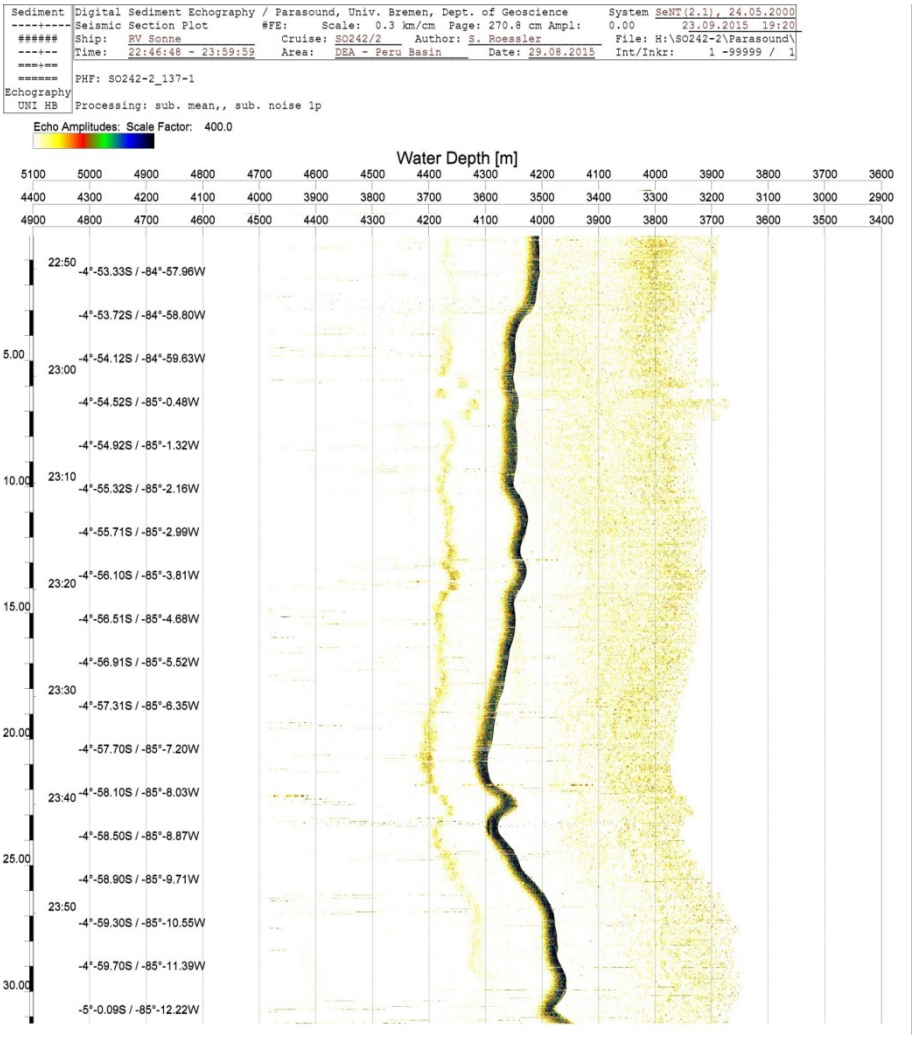


Figure 11.C.1. *Profile PHF_SO242-2_137-1_01.*

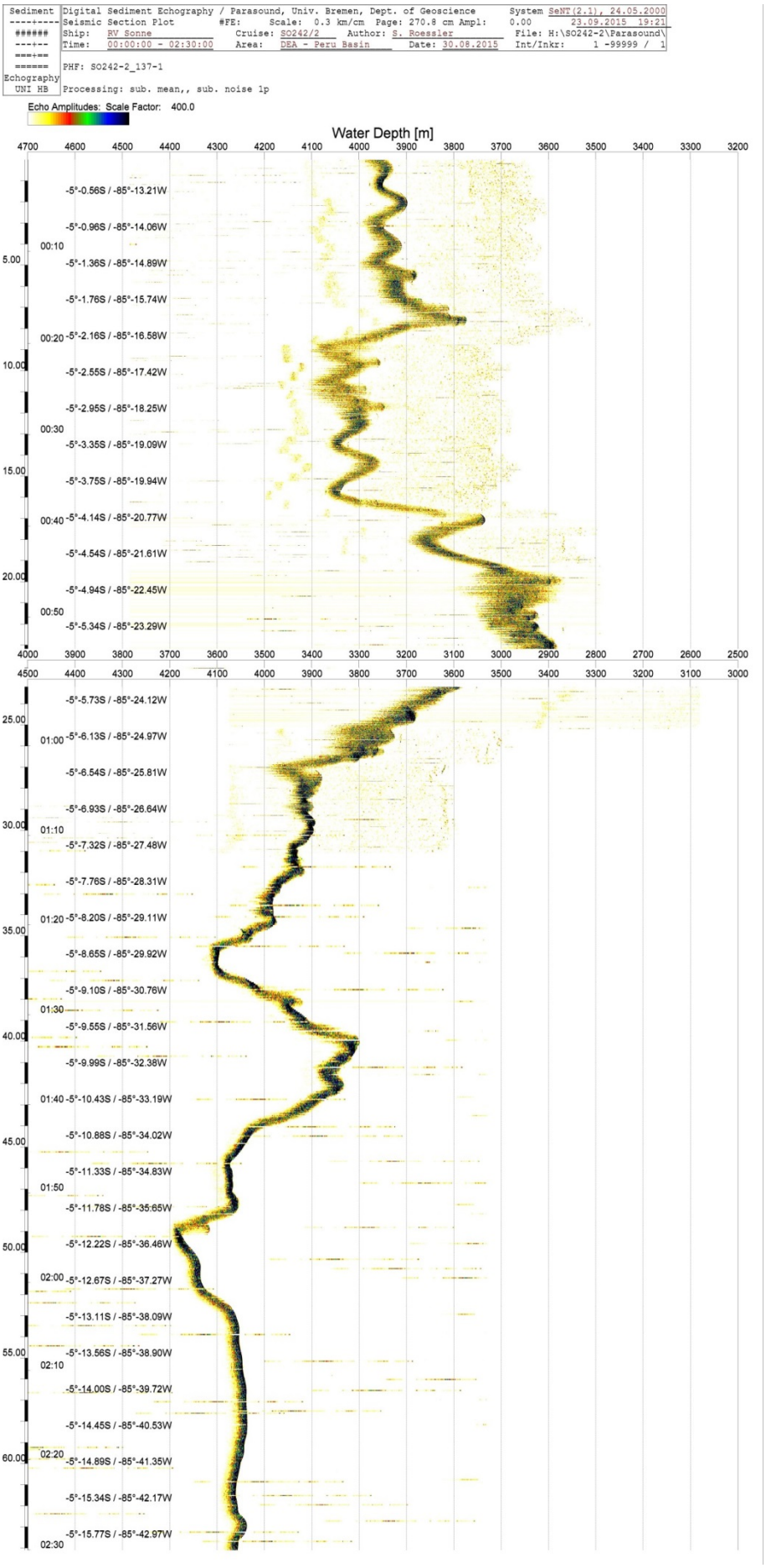


Figure 11.C.2. Profile PHF_SO242-2_137-1_02.

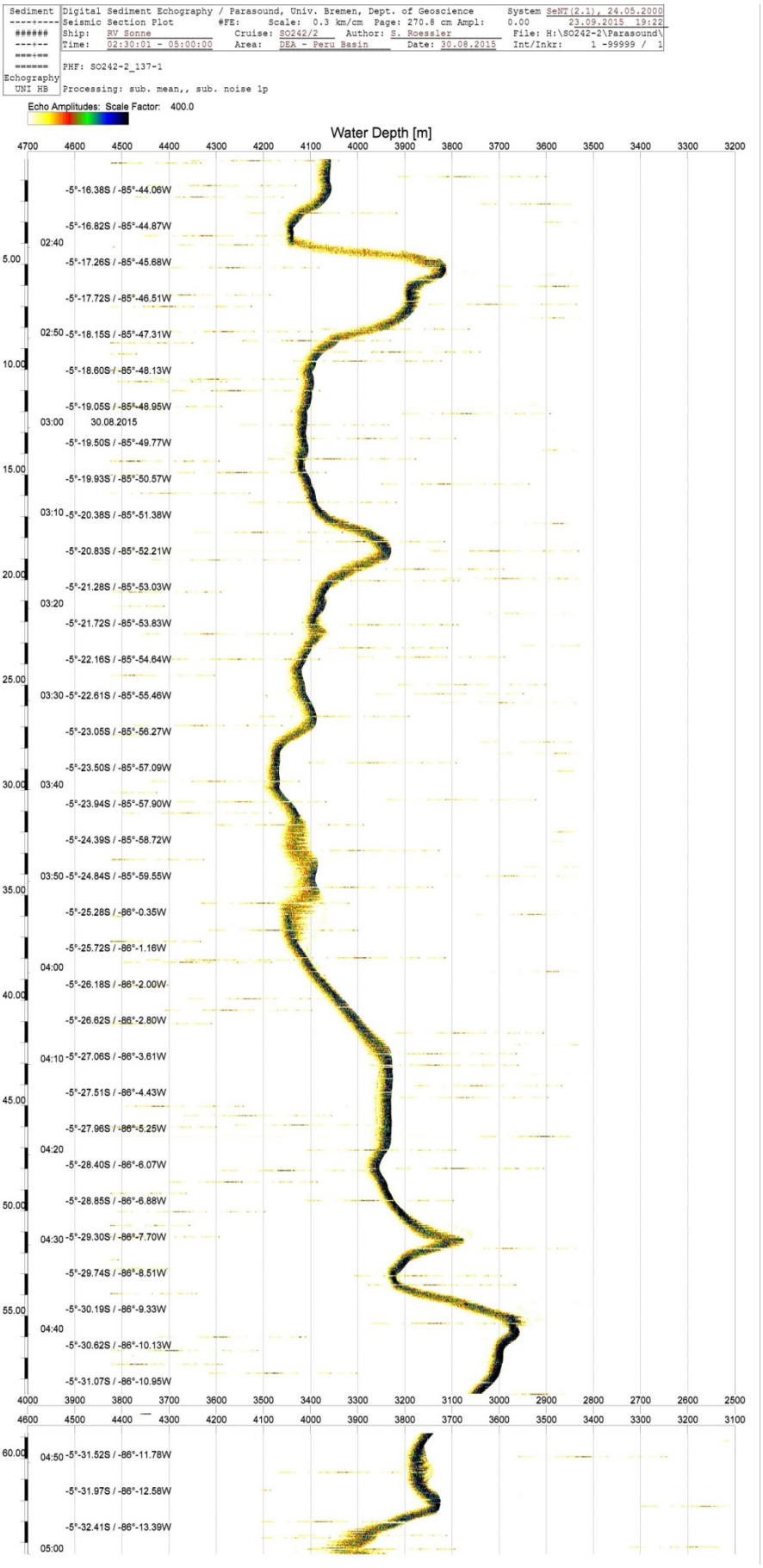


Figure 11.C.3. Profile PHF_SO242-2_137-1_03

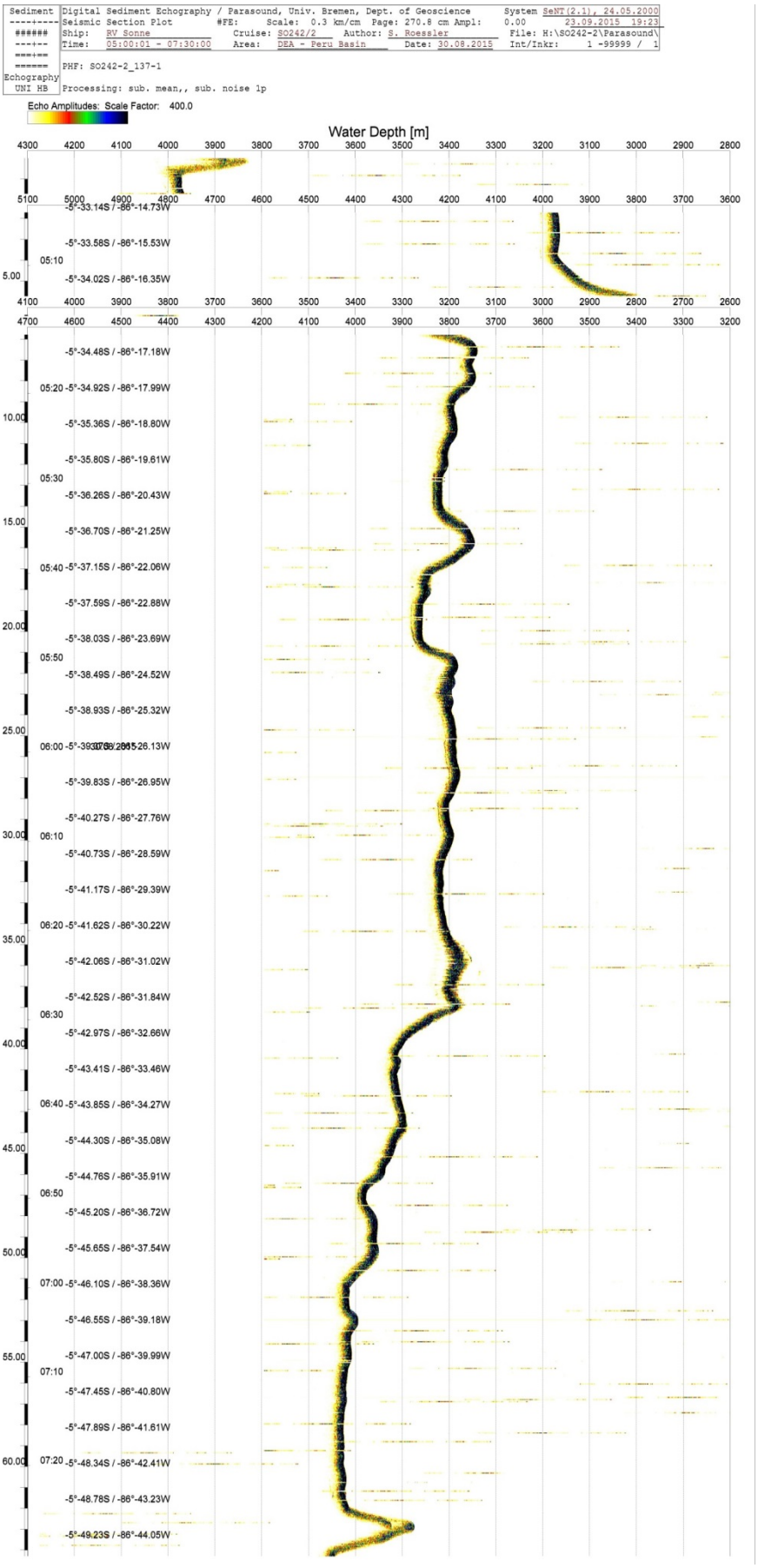


Figure 11.C.4. Profile PHF_SO242-2_137-1_04

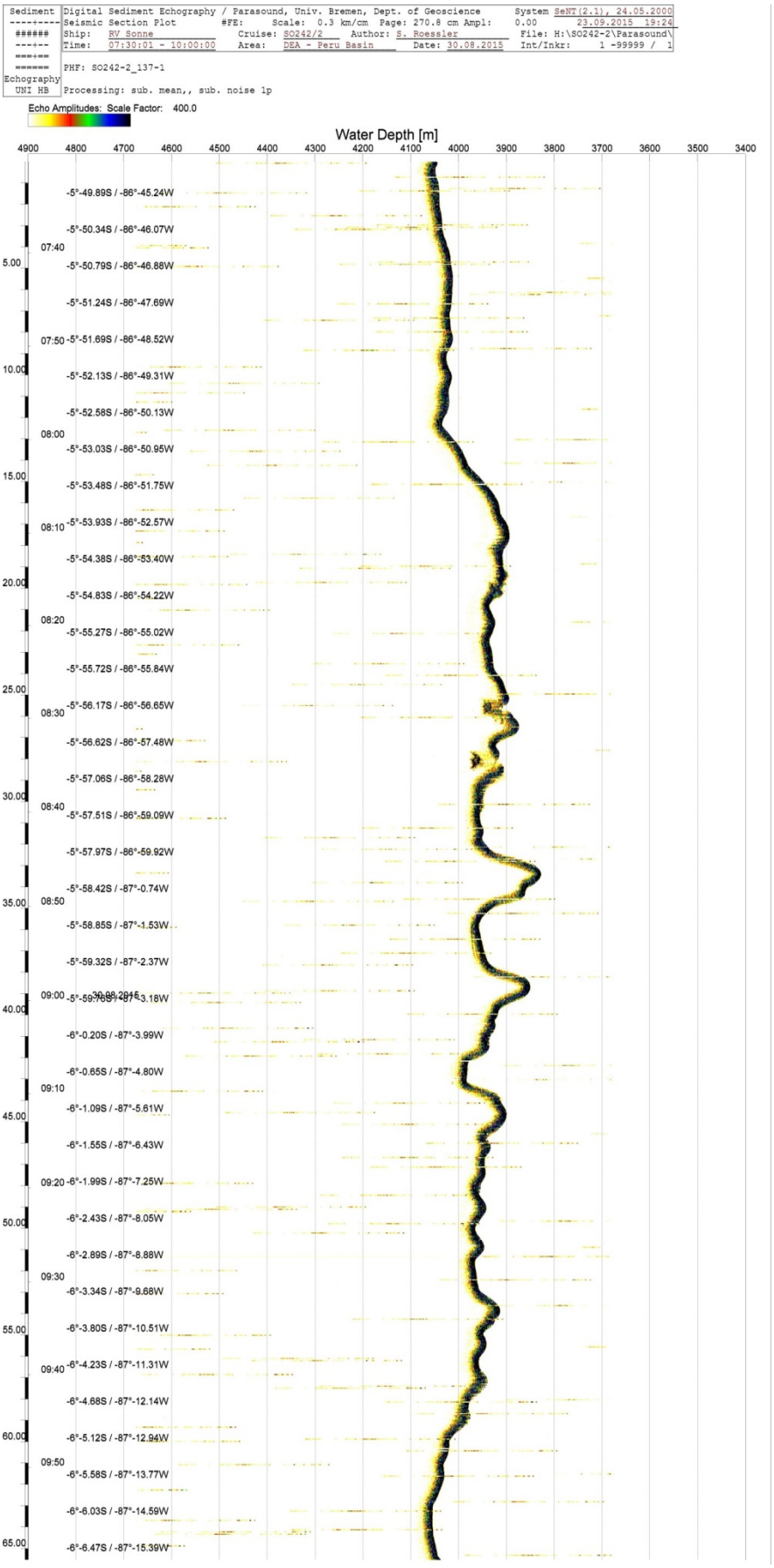


Figure 11.C.5. Profile PHF_SO242-2_137-1_05

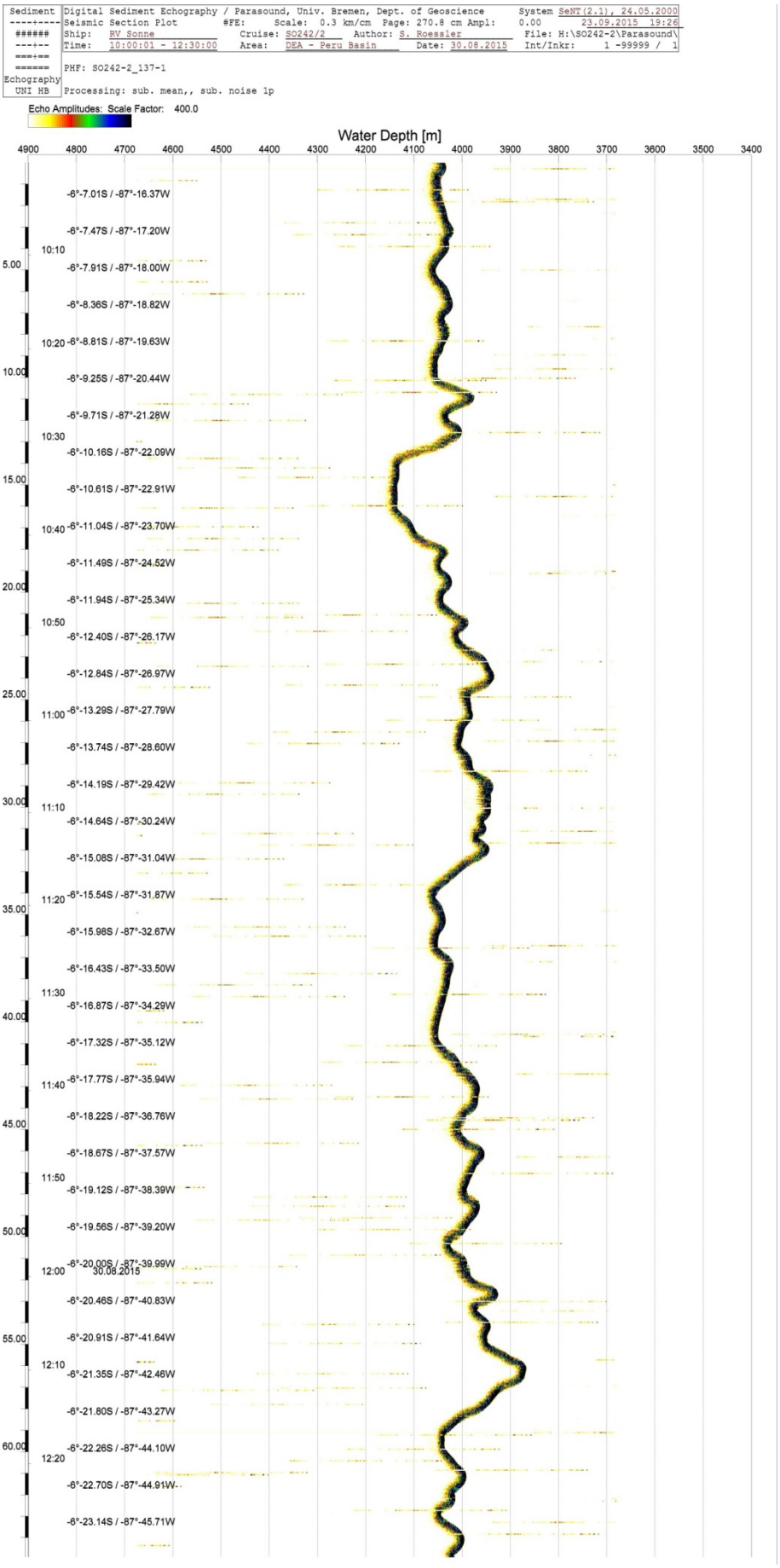


Figure 11.C.6. Profile PHF_SO242-2_137-1_06

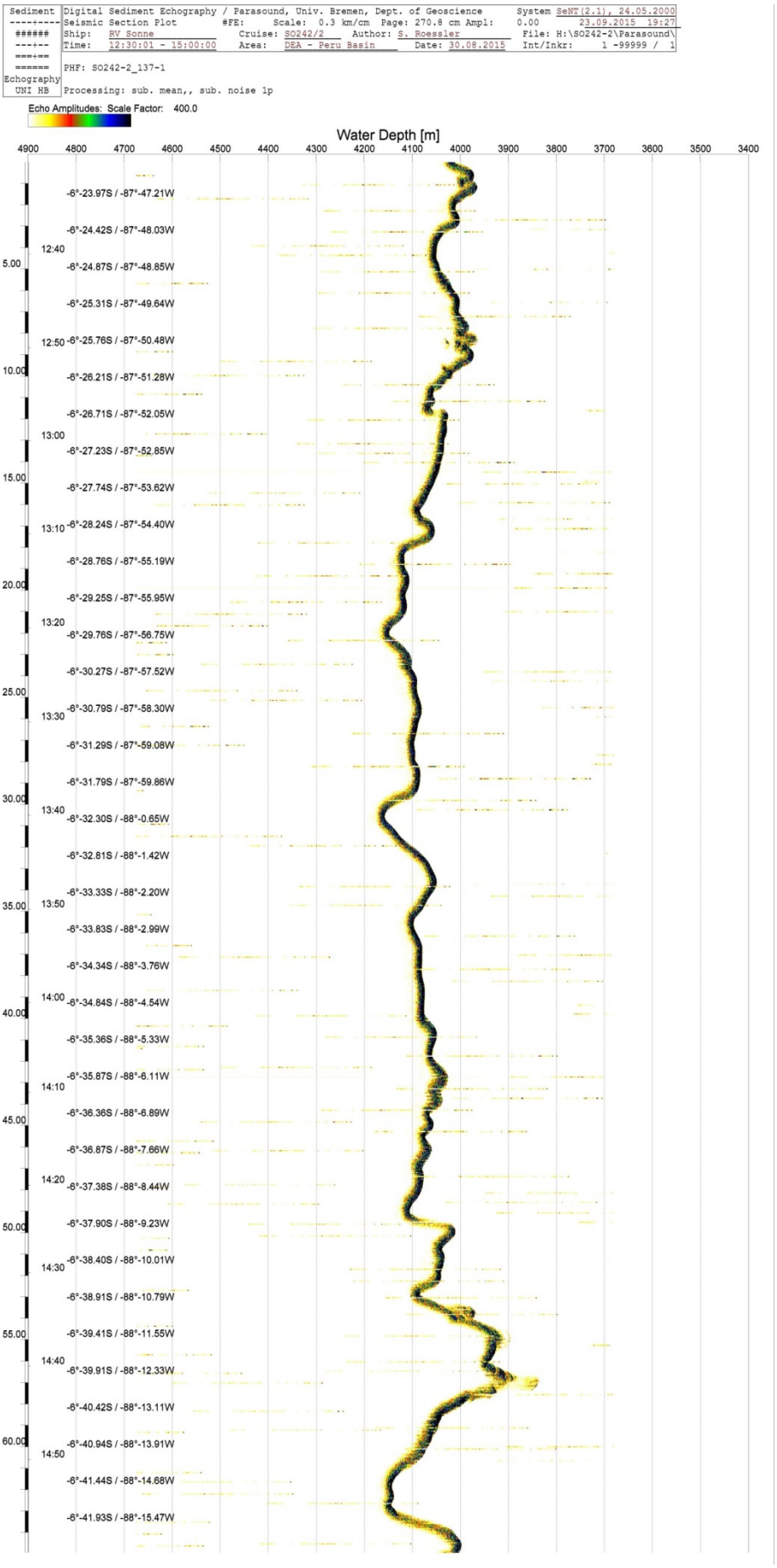


Figure 11.C.7. Profile PHF_SO242-2_137-1_07

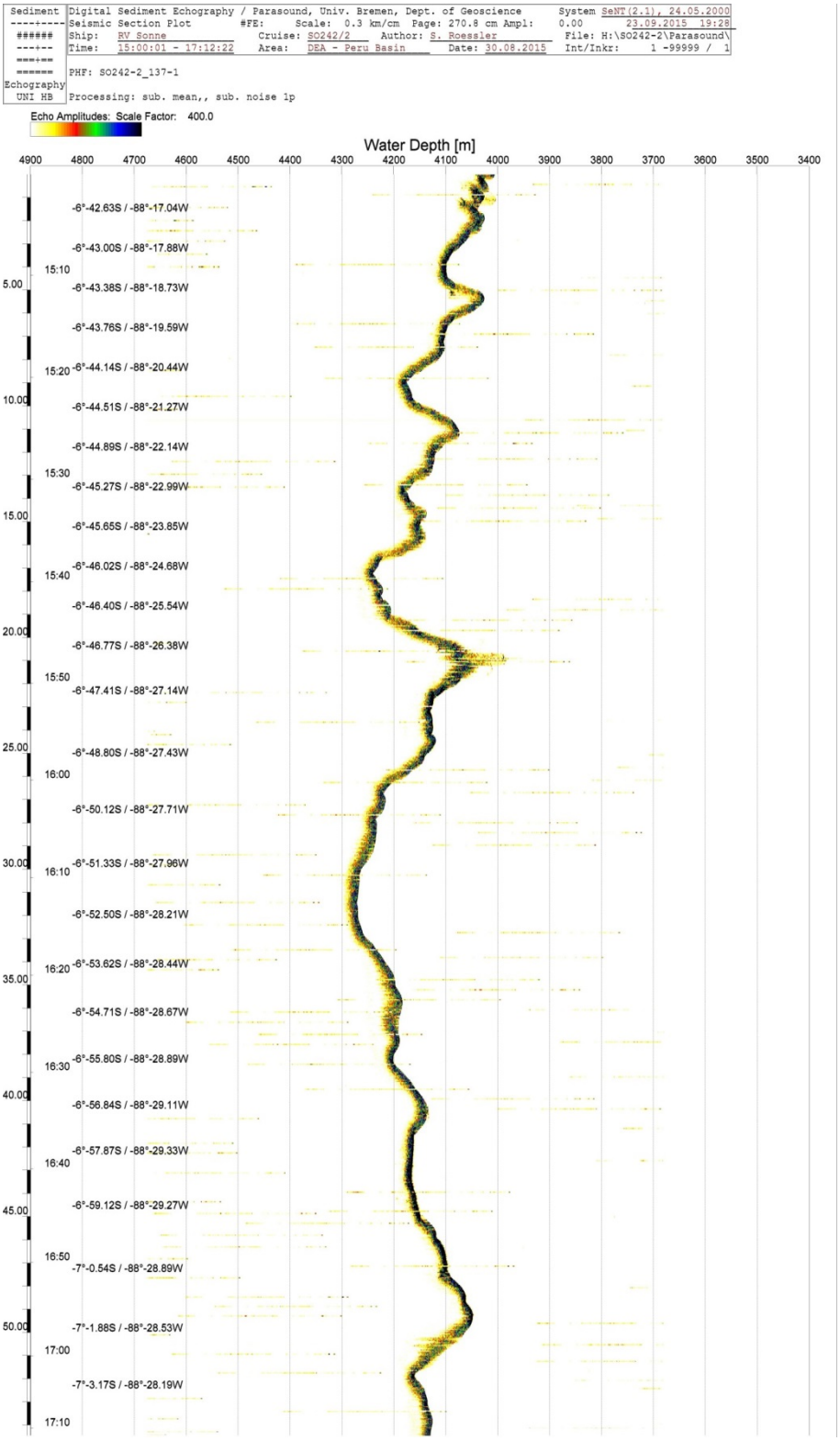


Figure 11.C.8. Profile PHF_SO242-2_137-1_08

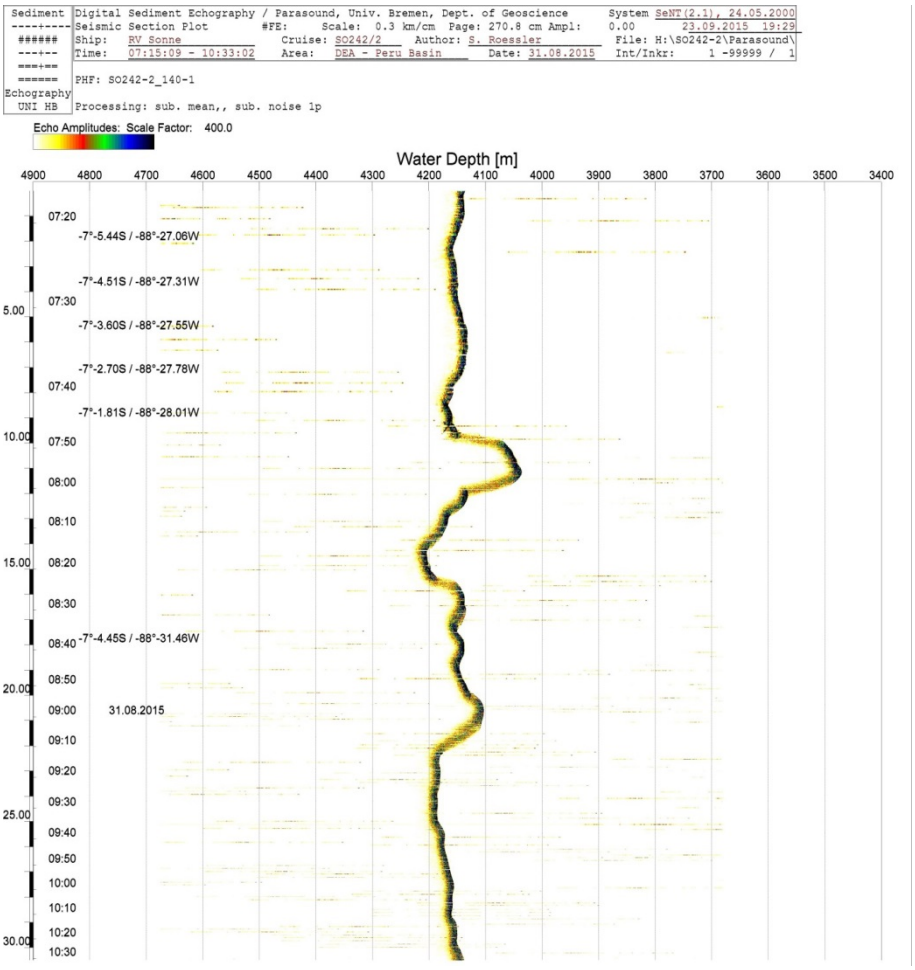


Figure 11.C.9. Profile PHF_SO242-2_140-1.

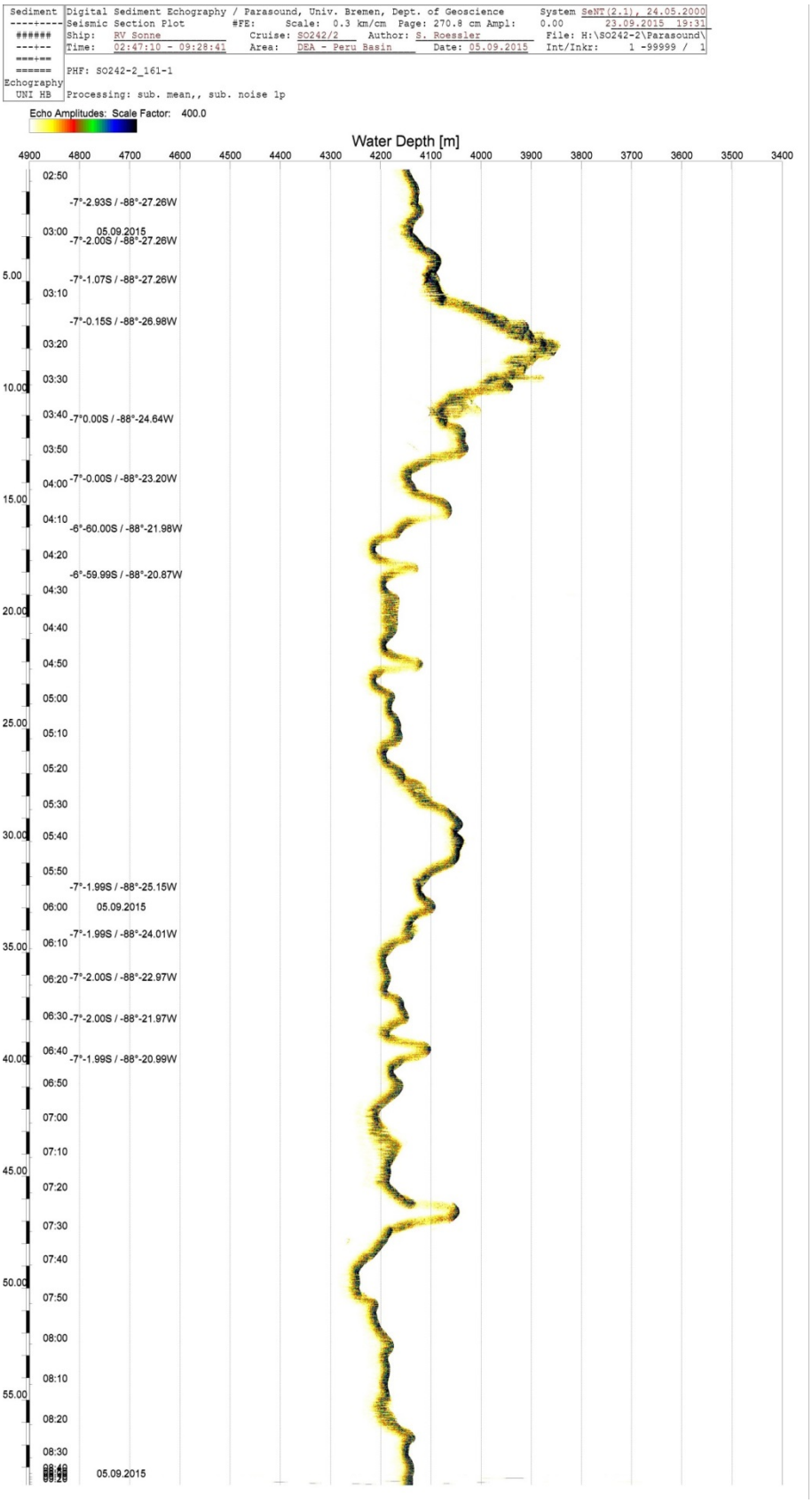


Figure 11.C.10. Profile PHF_SO242-2_161-1.

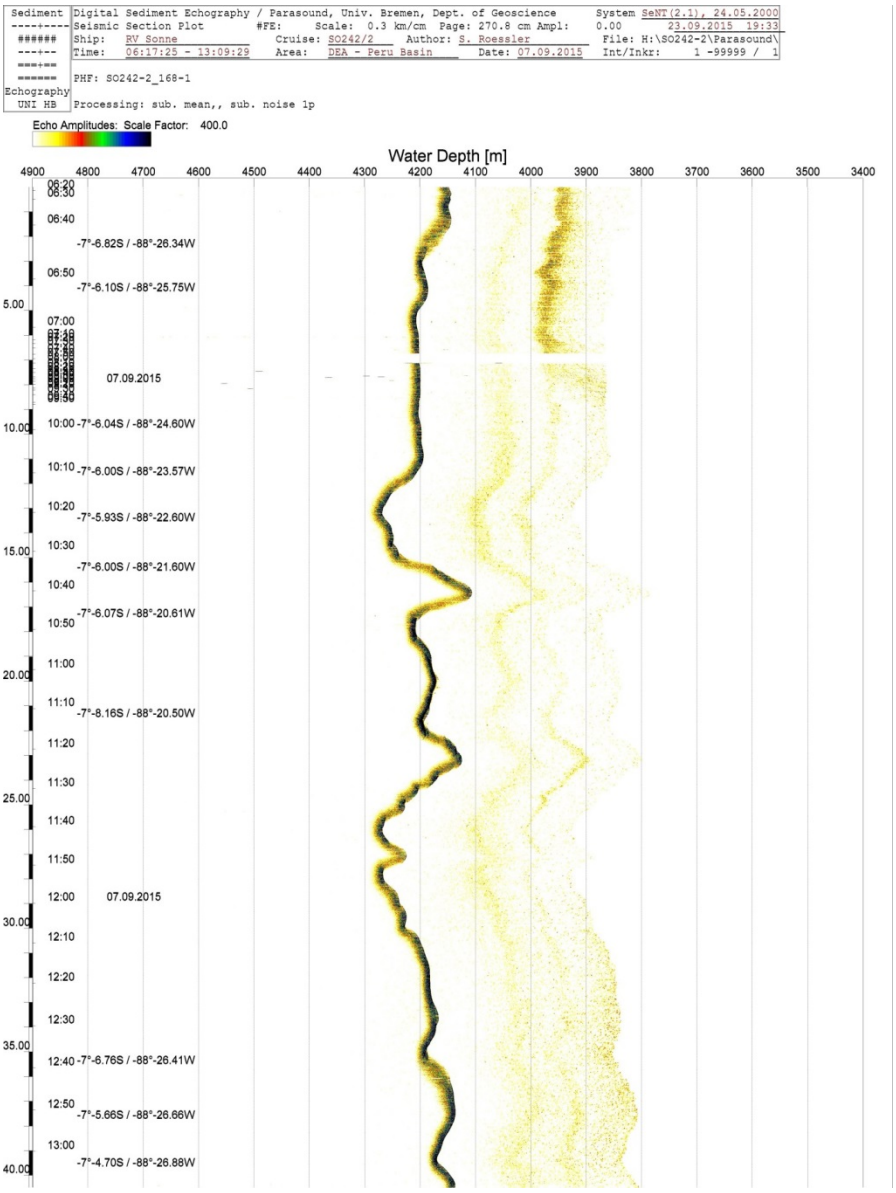


Figure 11.C.11. Profile PHF_SO242-2_168-1.

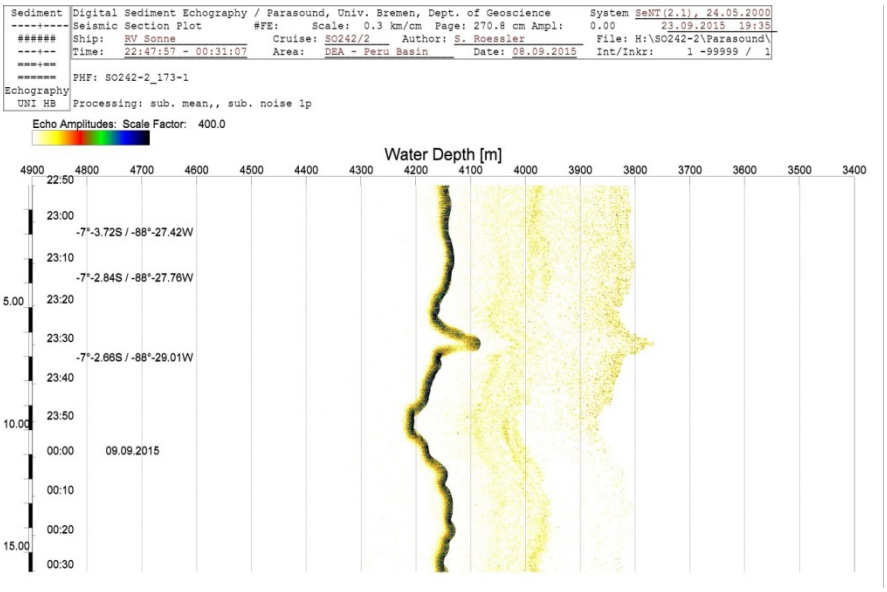


Figure 11.C.12. Profile PHF_SO242-2_173-1.

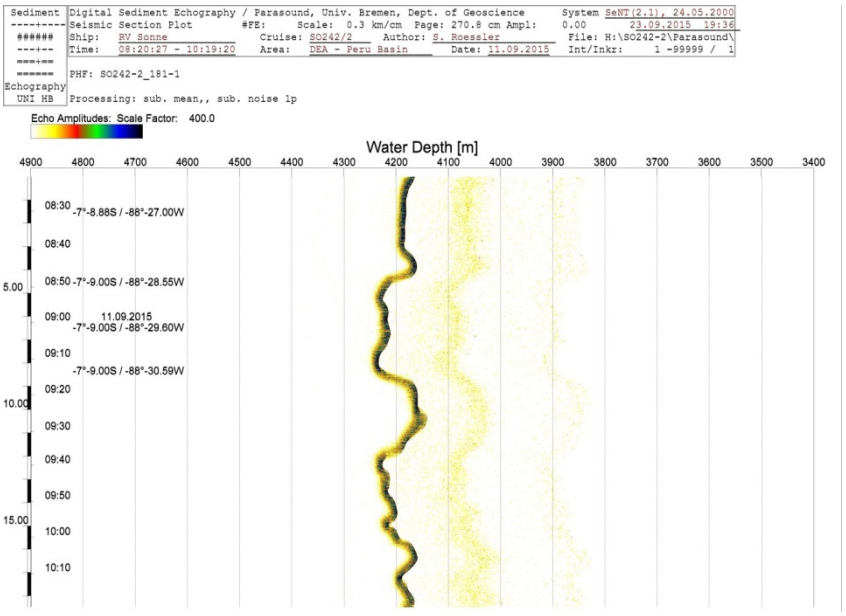


Figure 11.C.13. Profile PHF_SO242-2_181-1.

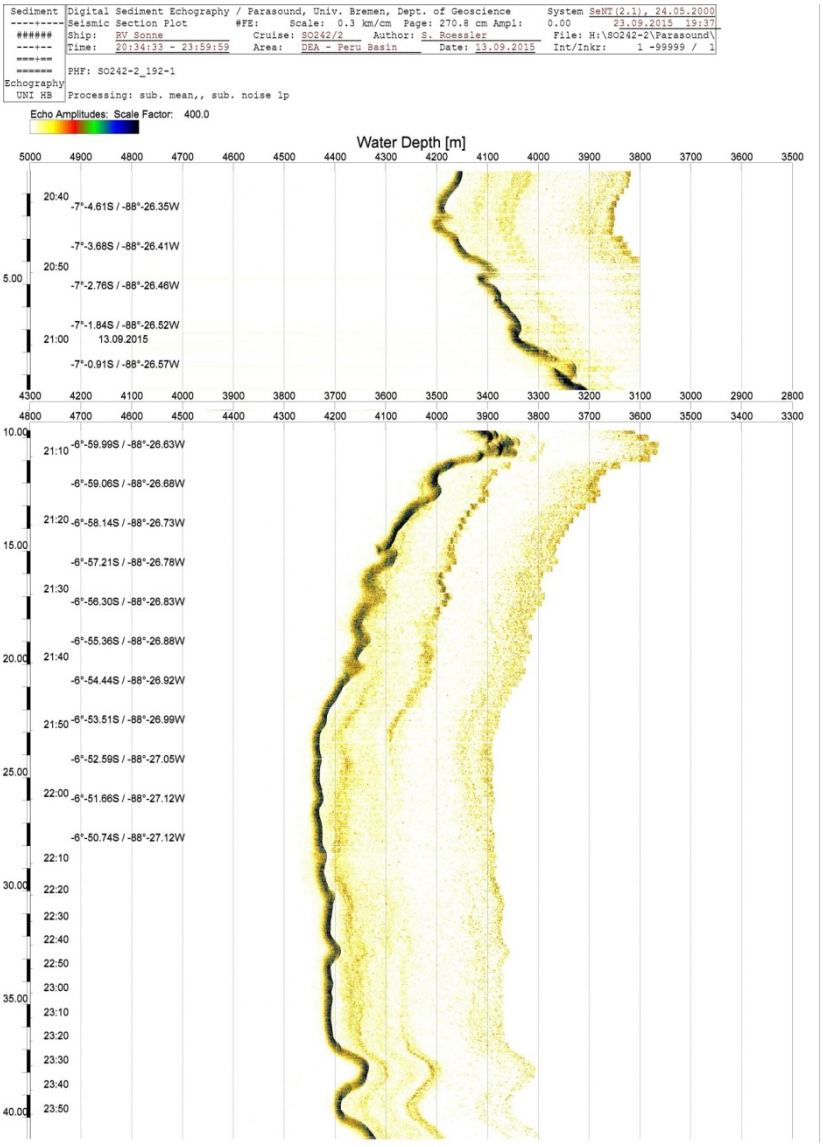


Figure 11.C.14. Profile PHF_SO242-2_192-1_01.

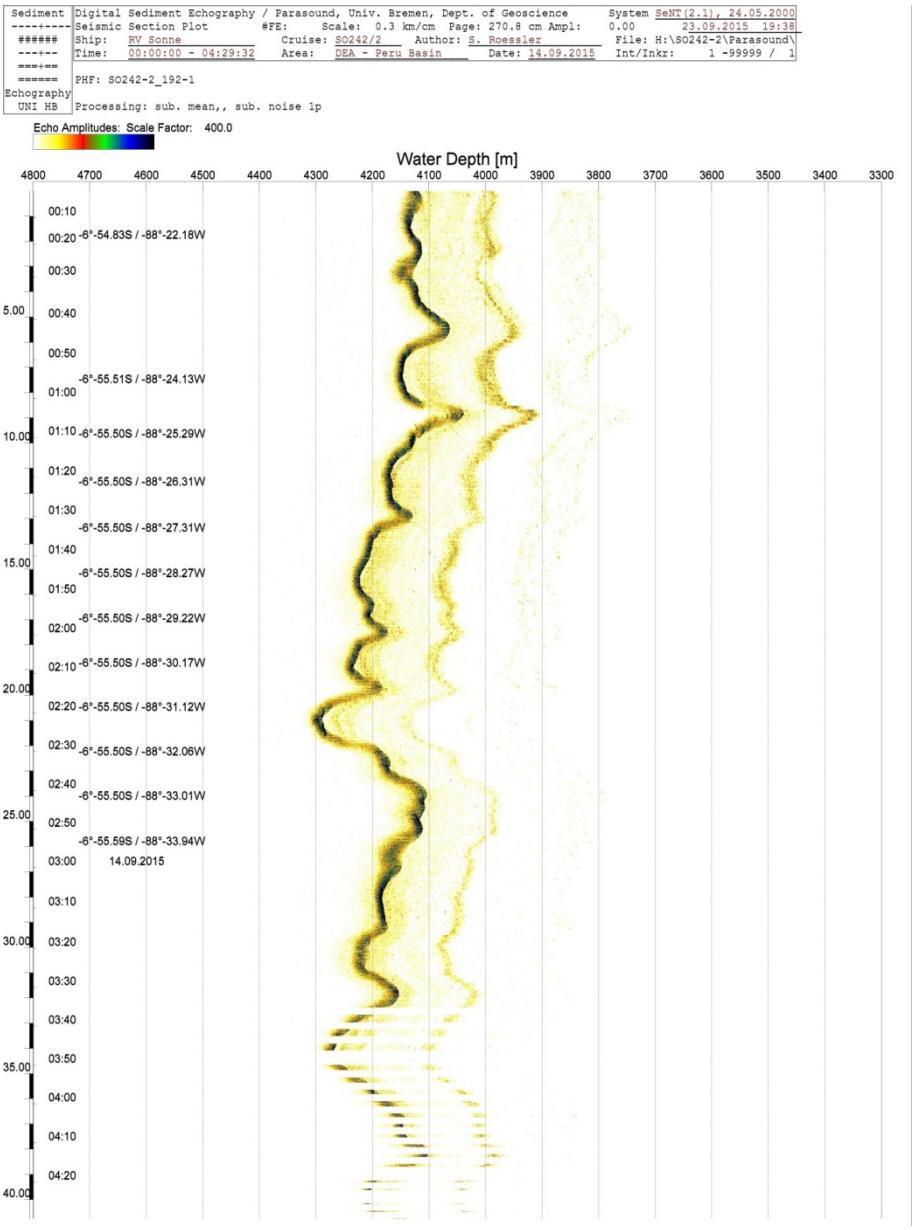


Figure 11.C.15. Profile PHF_SO242-2_192-1_02.

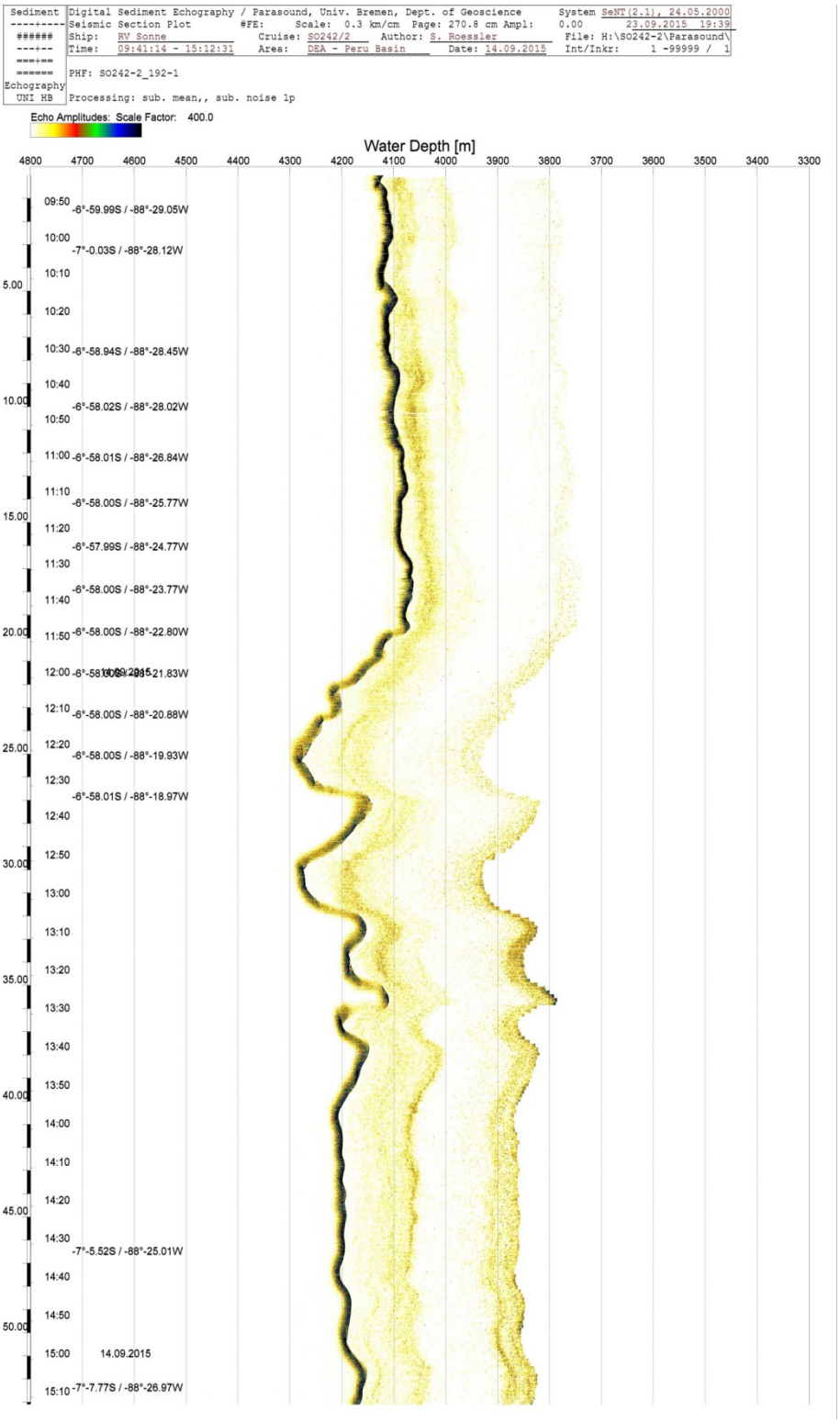


Figure 11.C.16. Profile PHF_SO242-2_192-1_03.

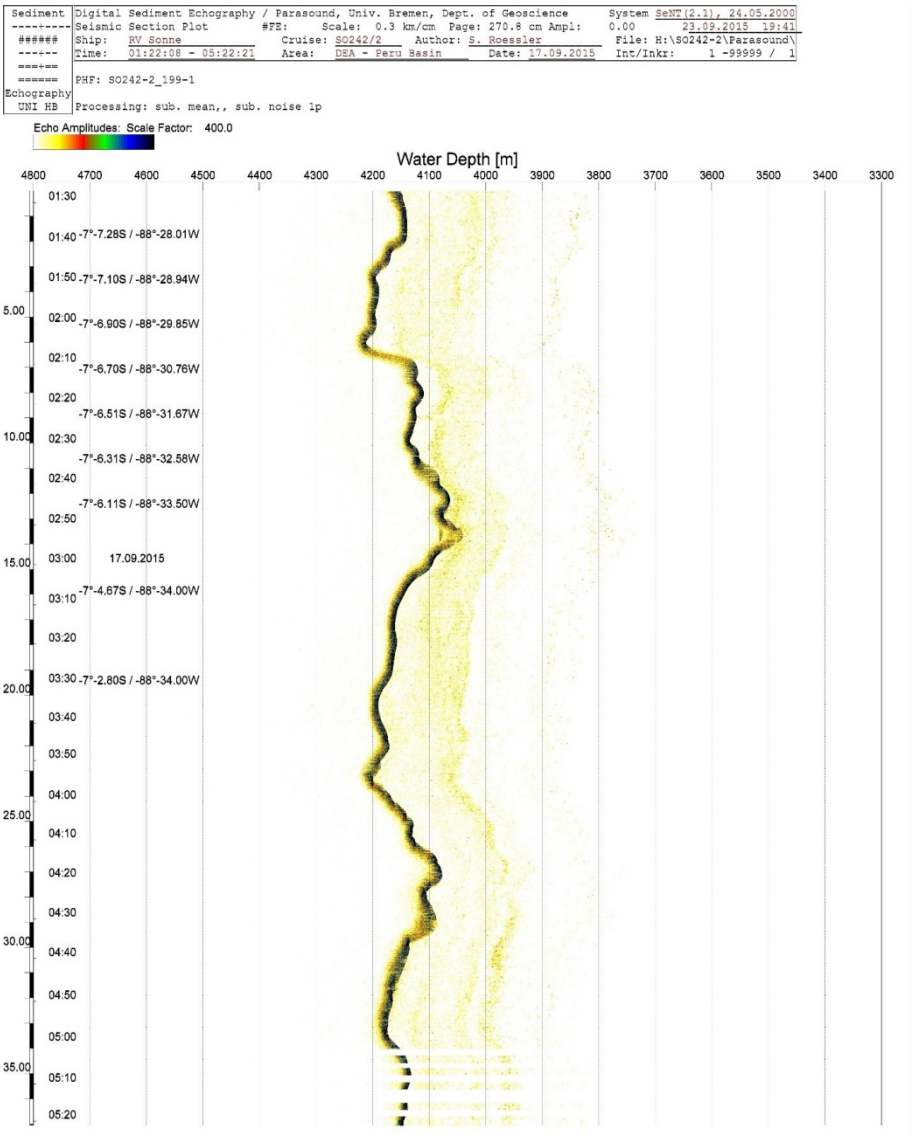


Figure 11.C.17. Profile PHF_SO242-2_199-1.

11.C.2. SLF Profiles

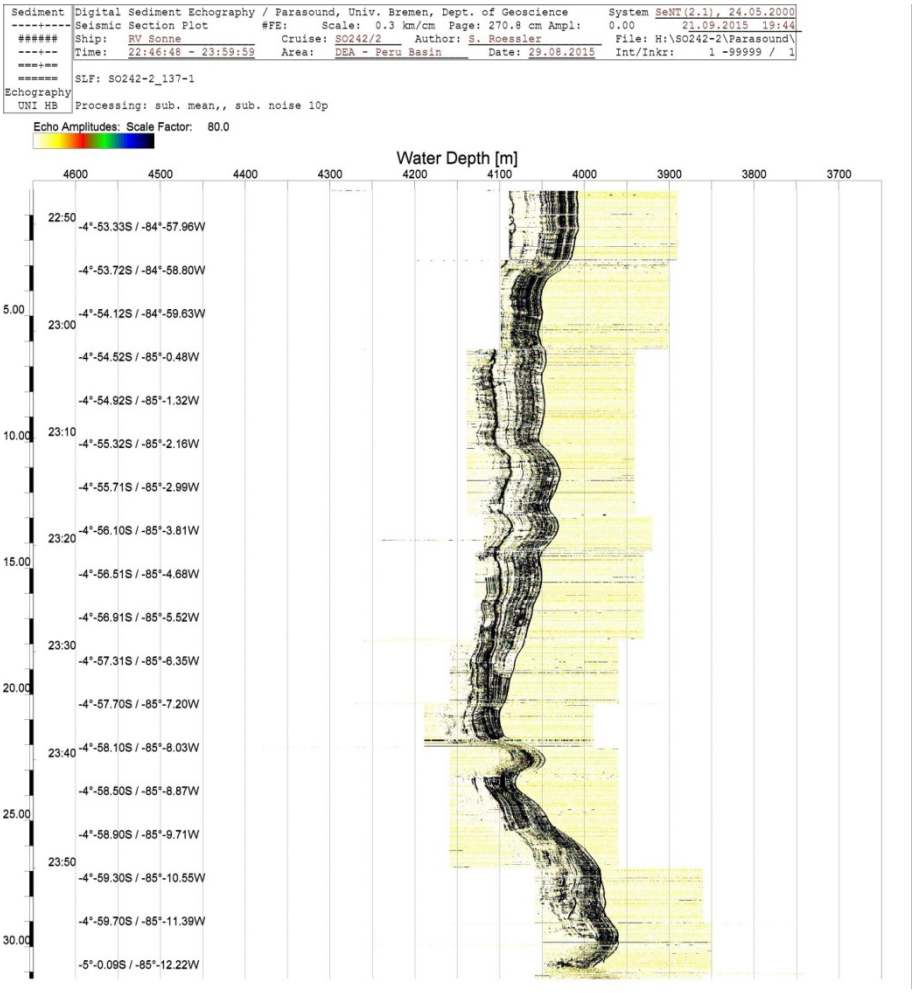


Figure 11.C.18. Profile SLF_SO242-2_137-1_01.

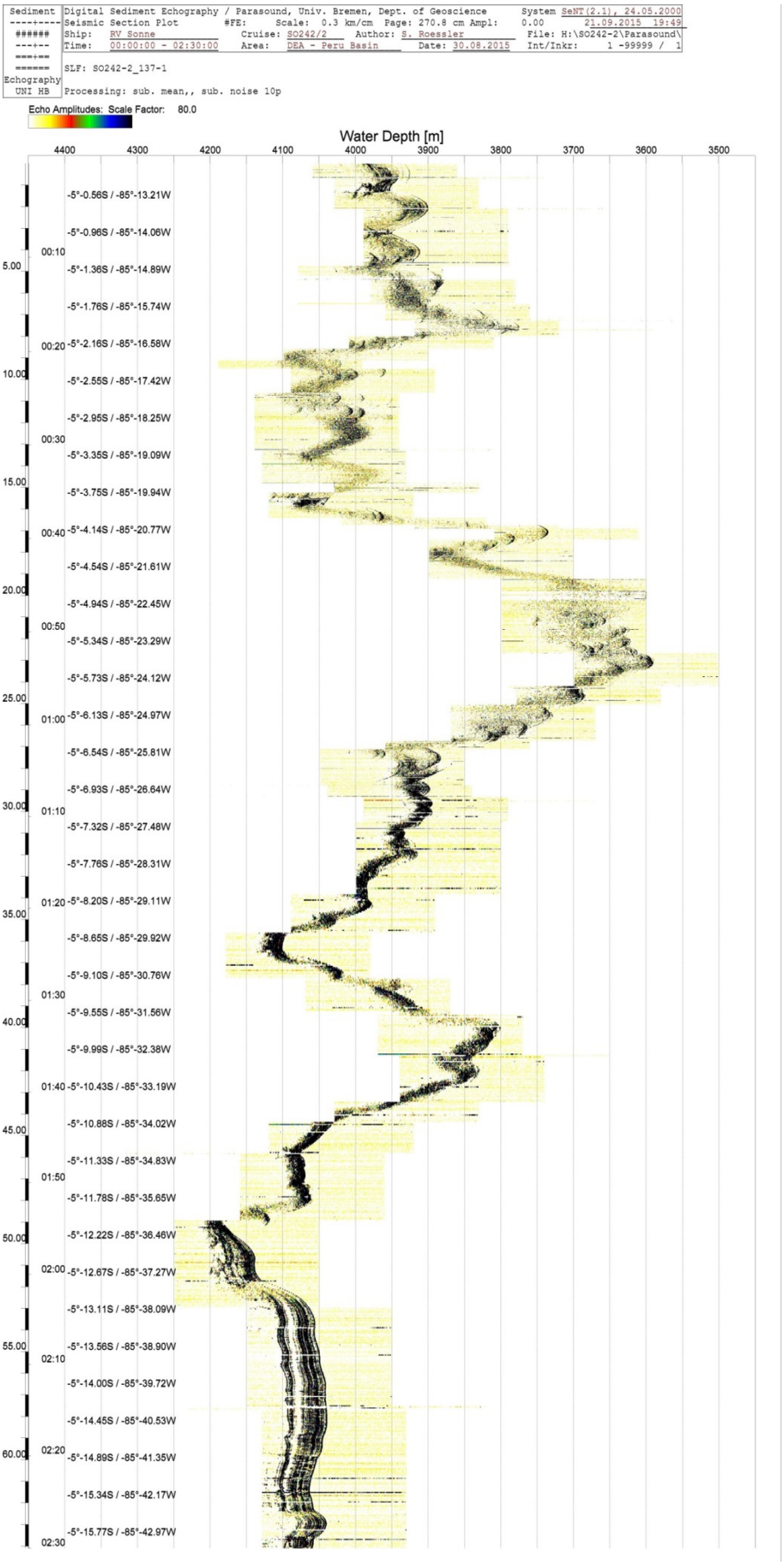


Figure 11.C.19. Profile SLF_SO242-2_137-1_02.

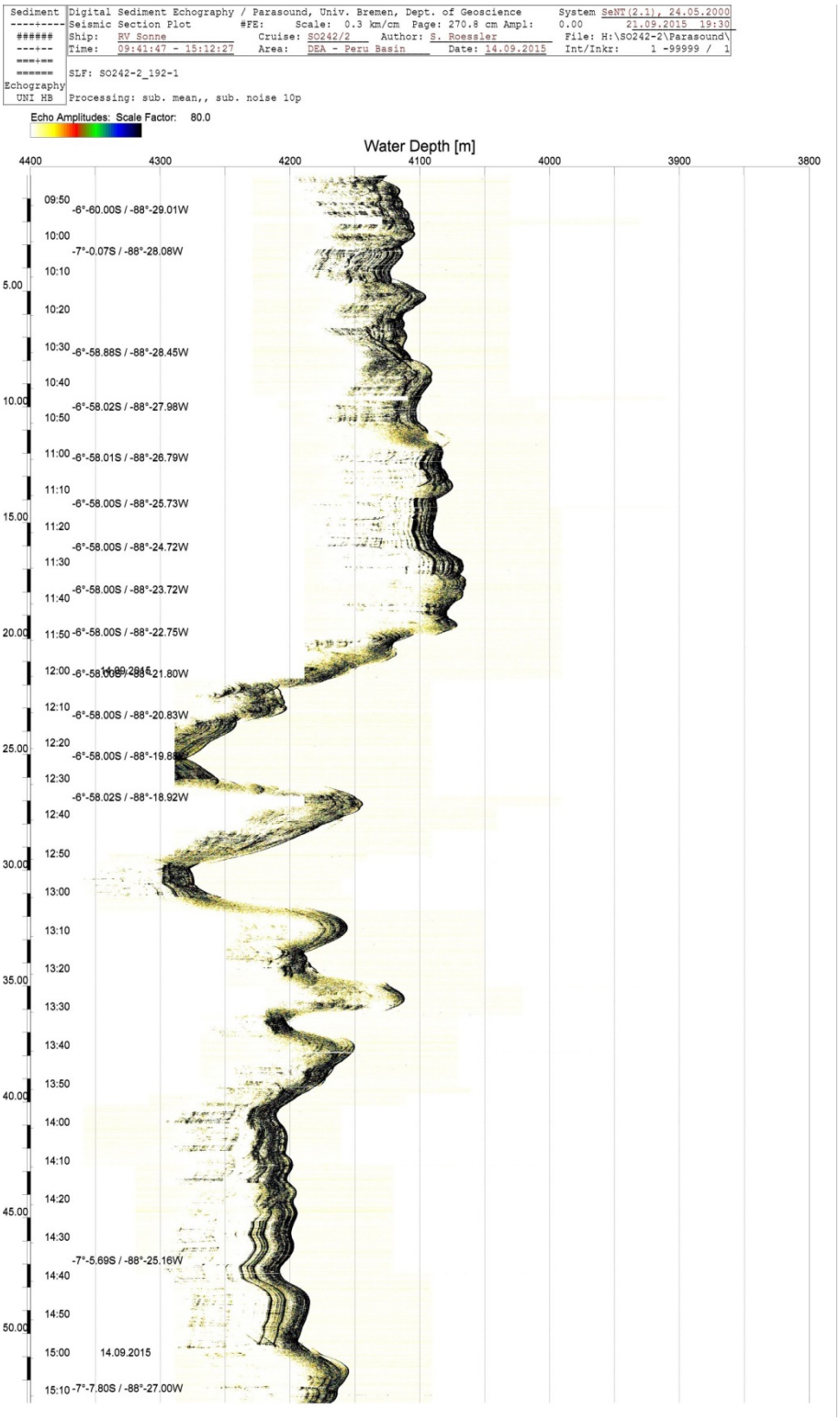


Figure 11.C.20. Profile SLF_SO242-2_137-1_03.

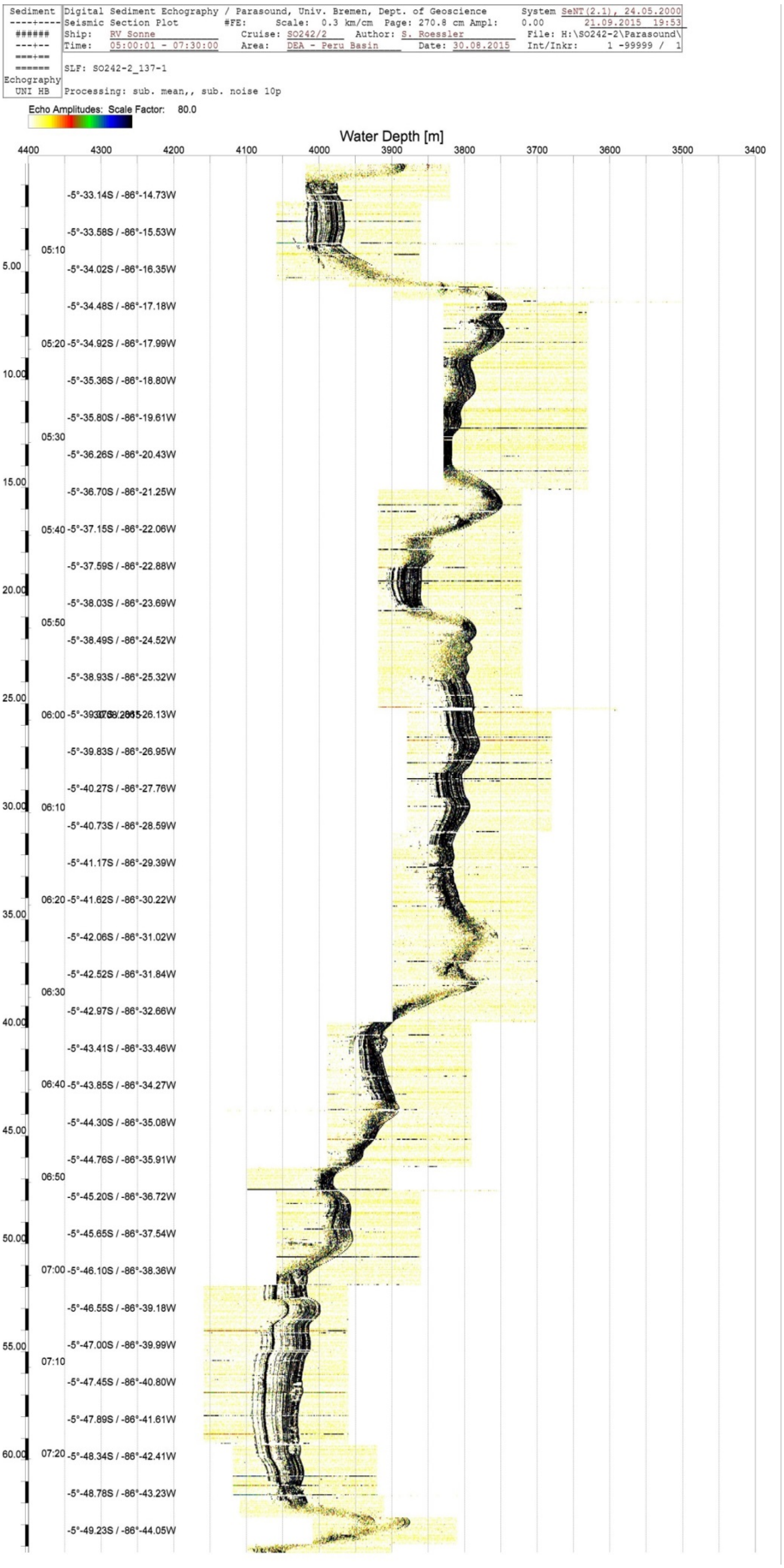


Figure 11.C.21. Profile SLF_SO242-2_137-1_04.

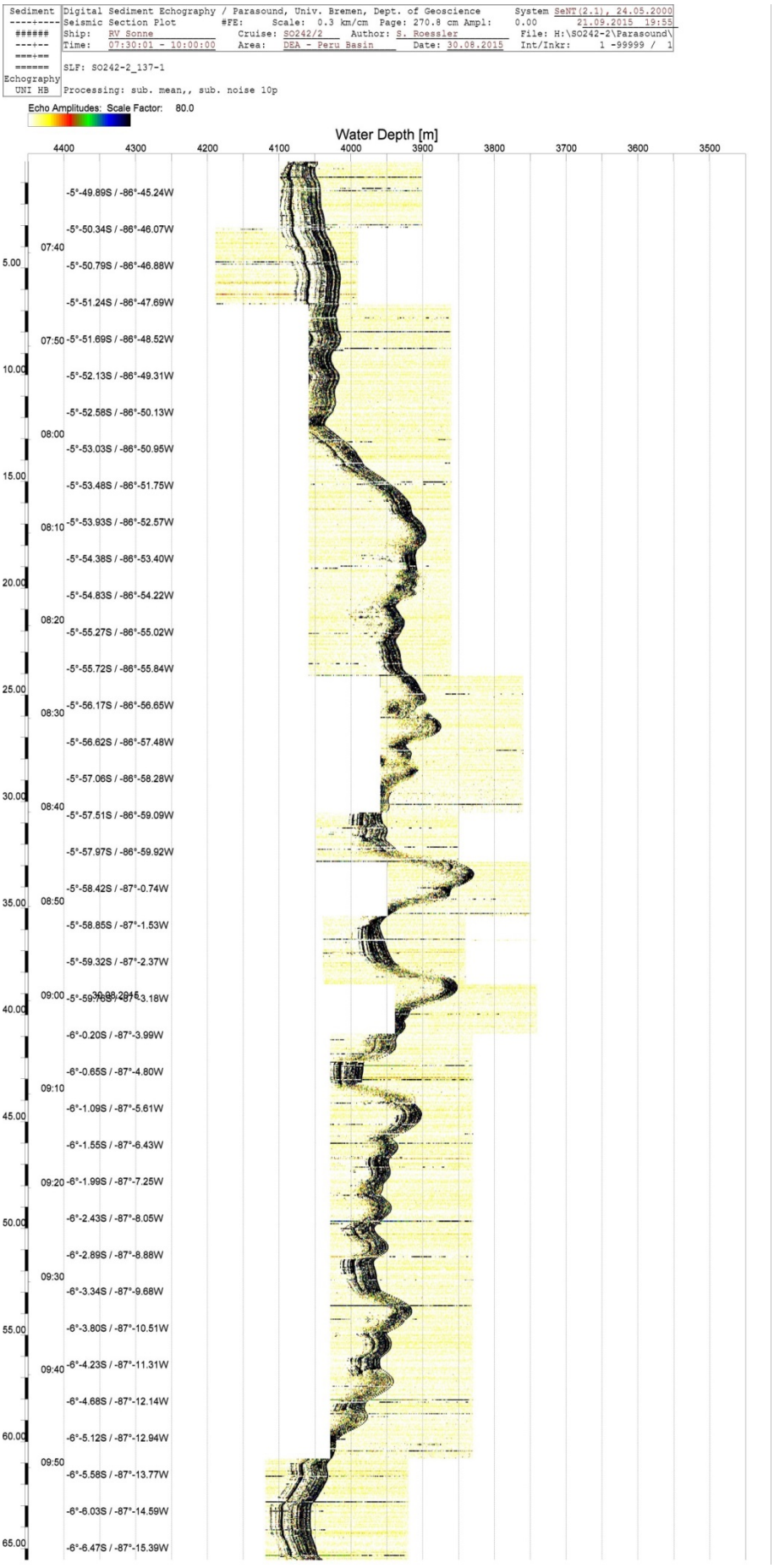


Figure 11.C.22. Profile SLF_SO242-2_137-1_05.

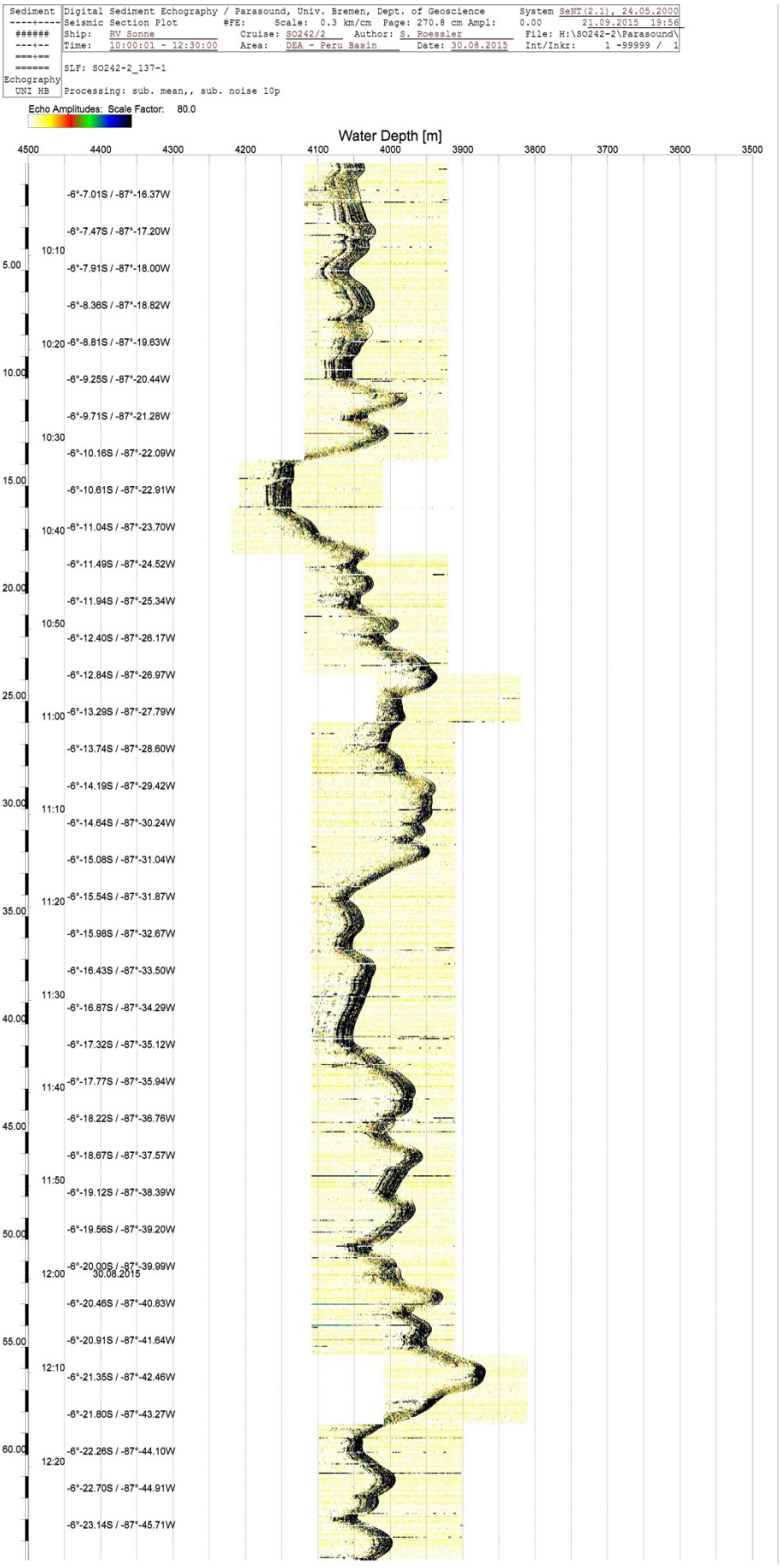


Figure 11.C.23. Profile SLF_SO242-2_137-1_06.

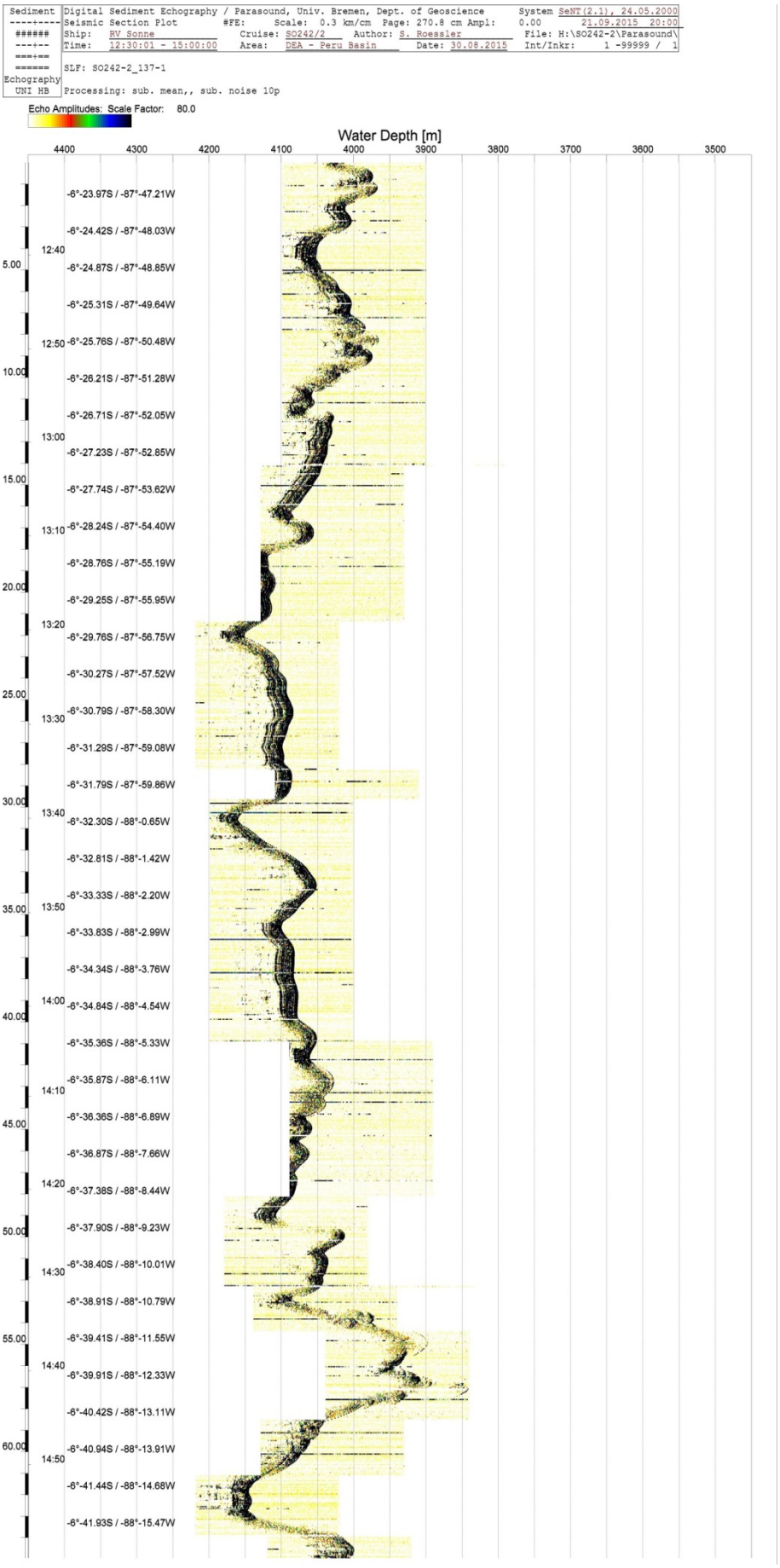


Figure 11.C.24. Profile SLF_SO242-2_137-1_07.

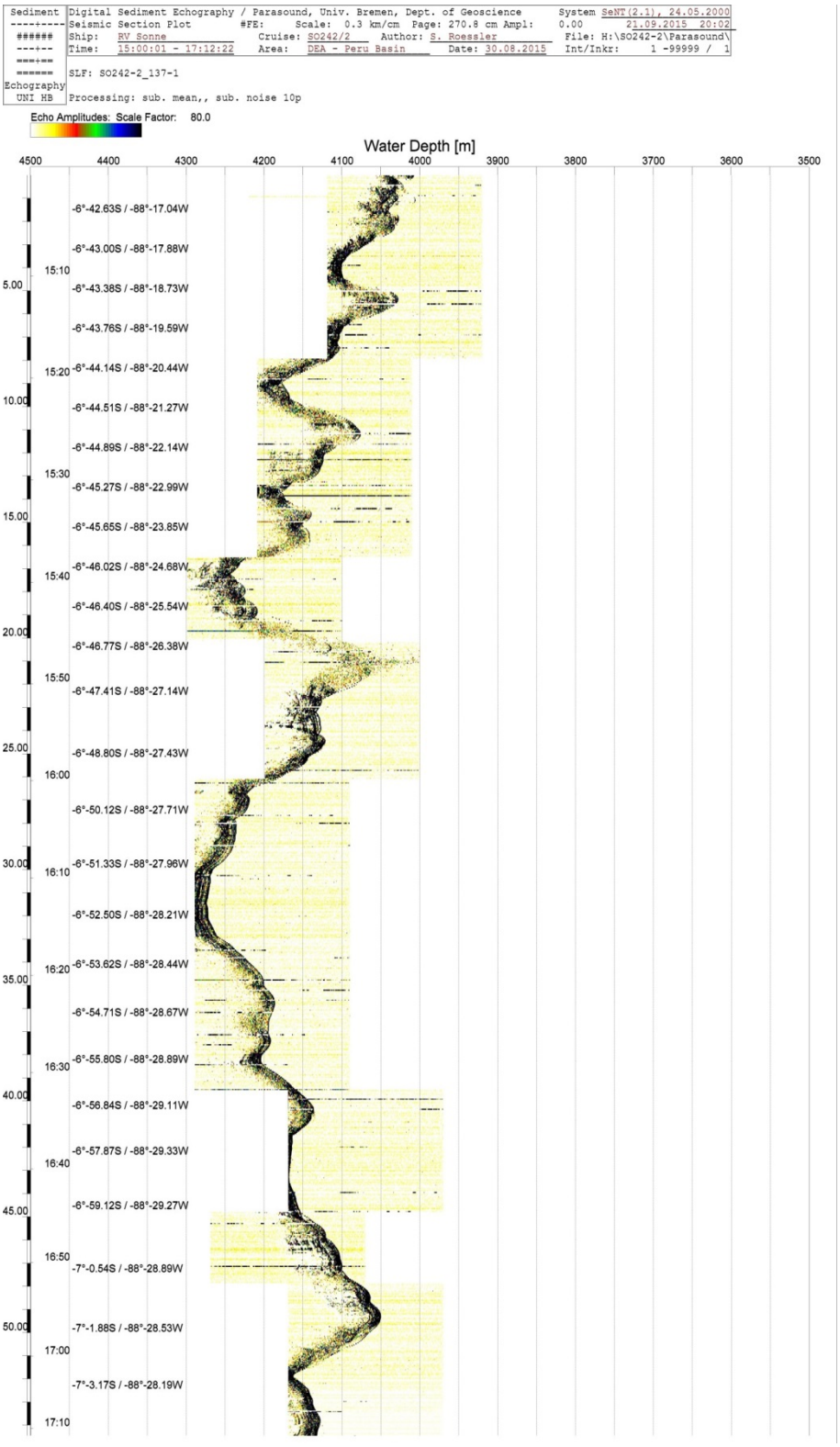


Figure 11.C.25. Profile SLF_SO242-2_137-1_08.

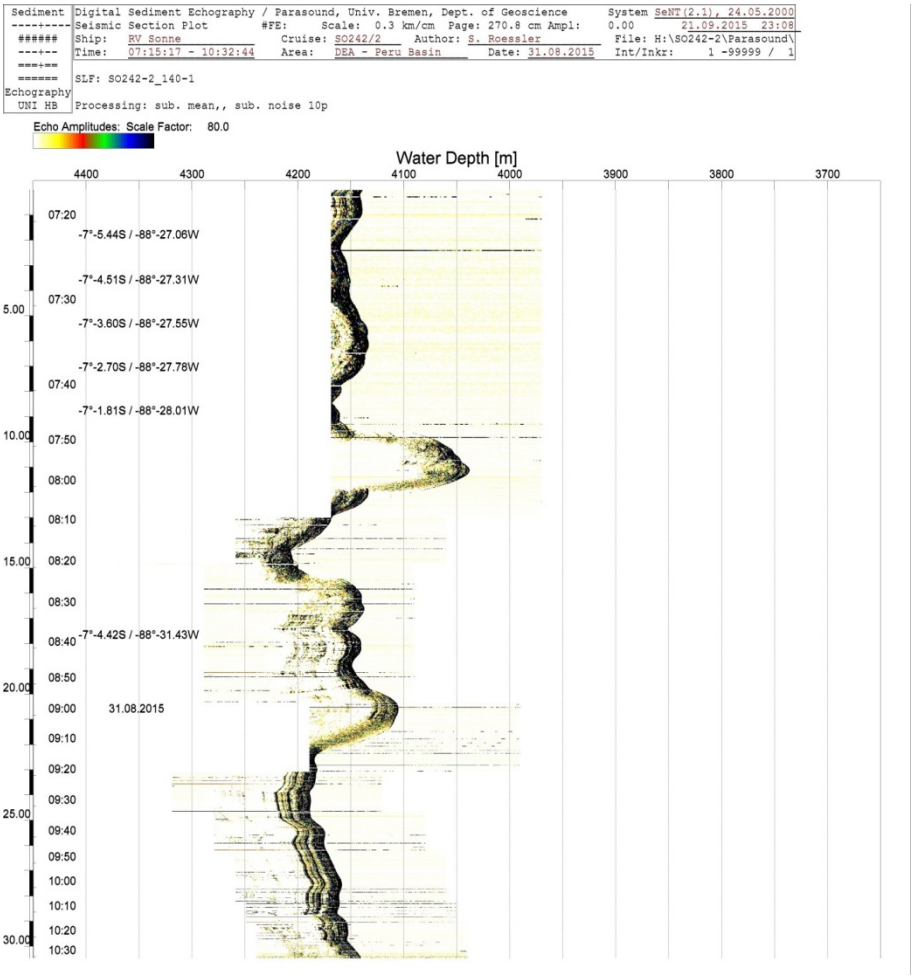


Figure 11.C.26. Profile SLF_SO242-2_140-1.

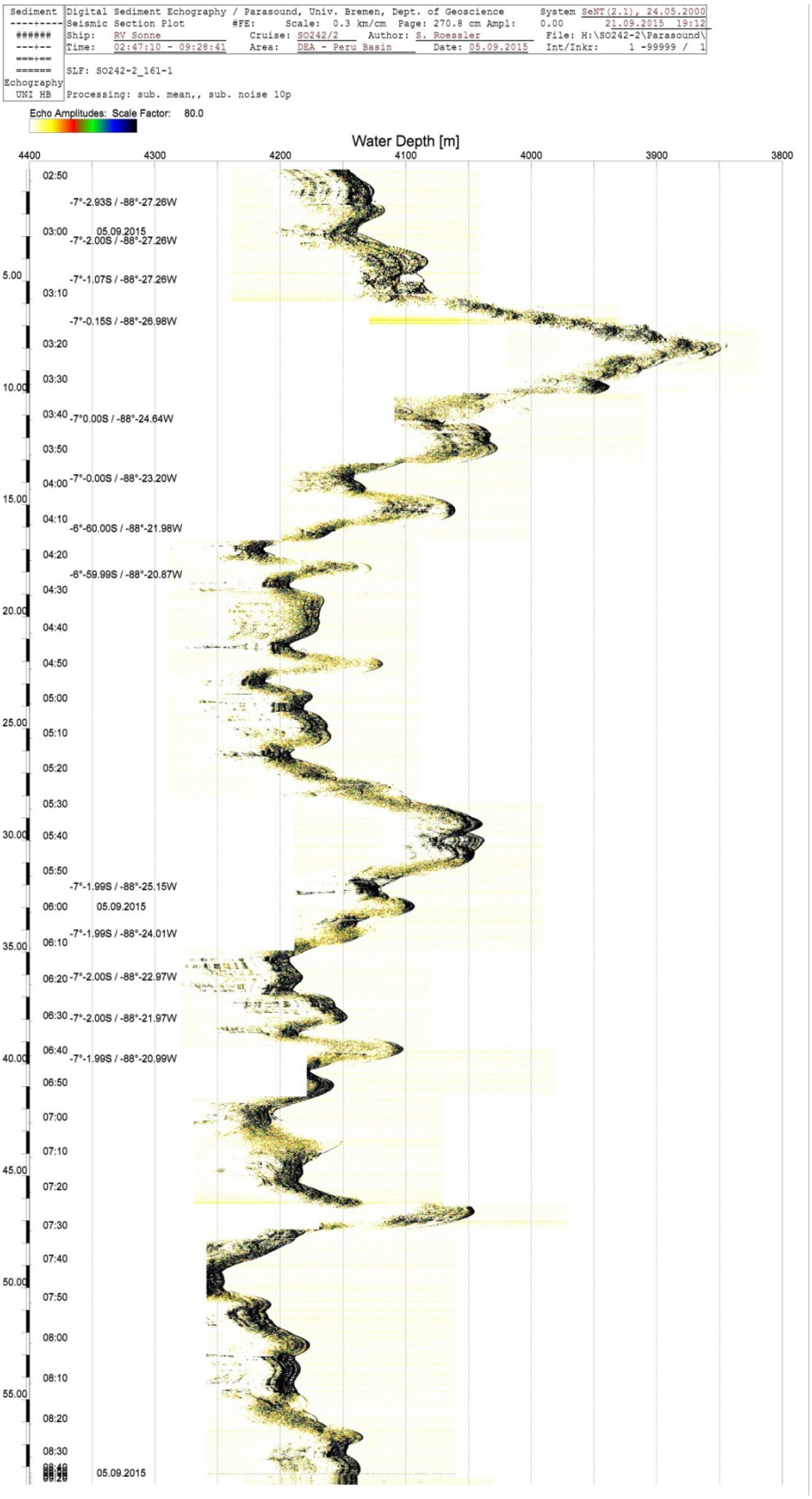


Figure 11.C.27. Profile SLF_SO242-2_161-1.

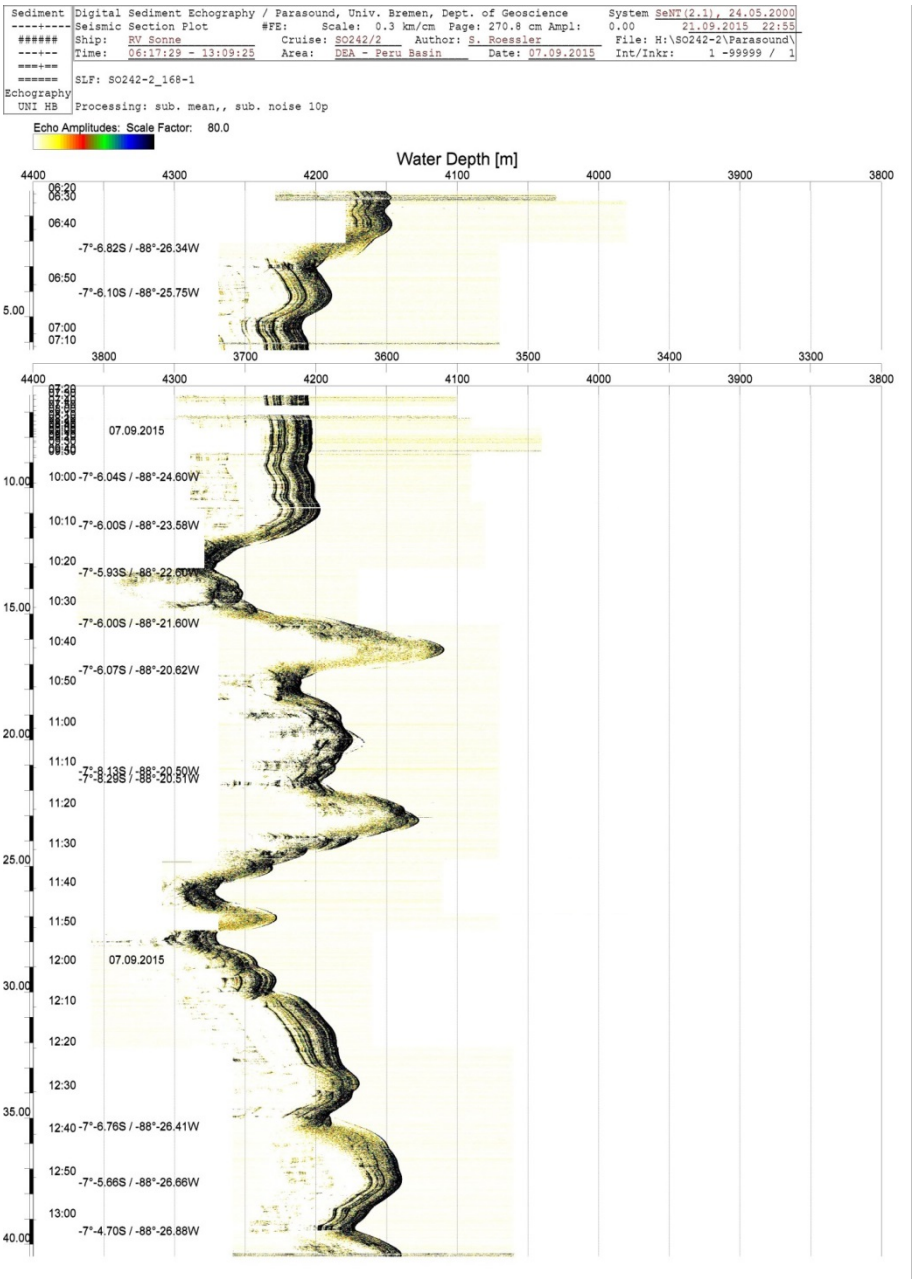


Figure 11.C.28. Profile SLF_SO242-2_168-1.

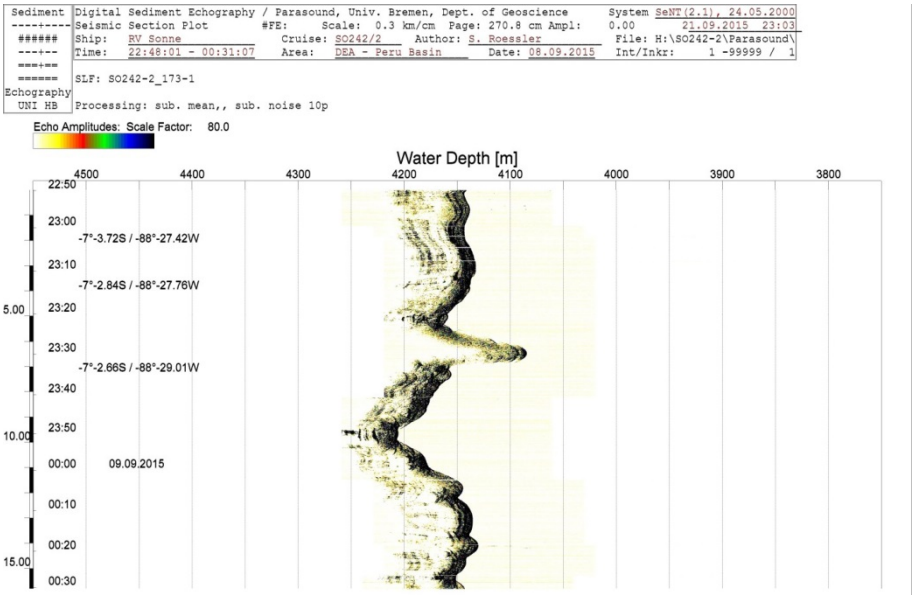


Figure 11.C.29. Profile SLF_SO242-2_173-1.

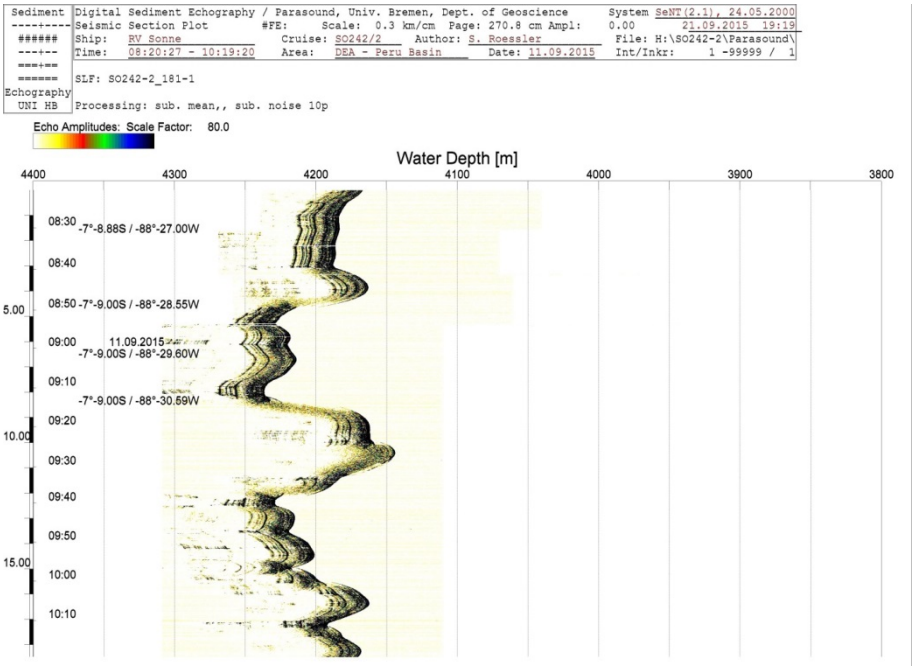


Figure 11.C.30. Profile SLF_SO242-2_181-1.

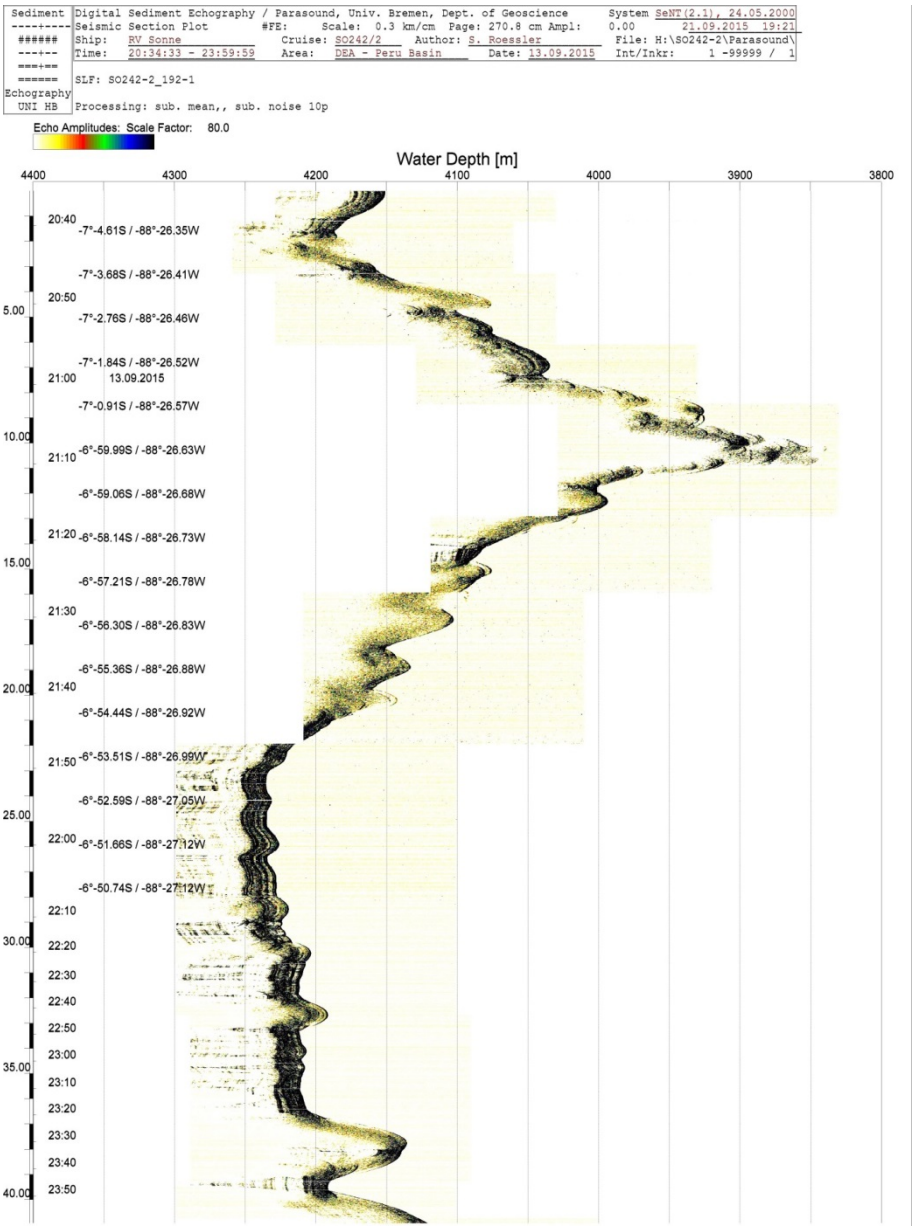


Figure 11.C.31. Profile SLF_SO242-2_192-1_01.

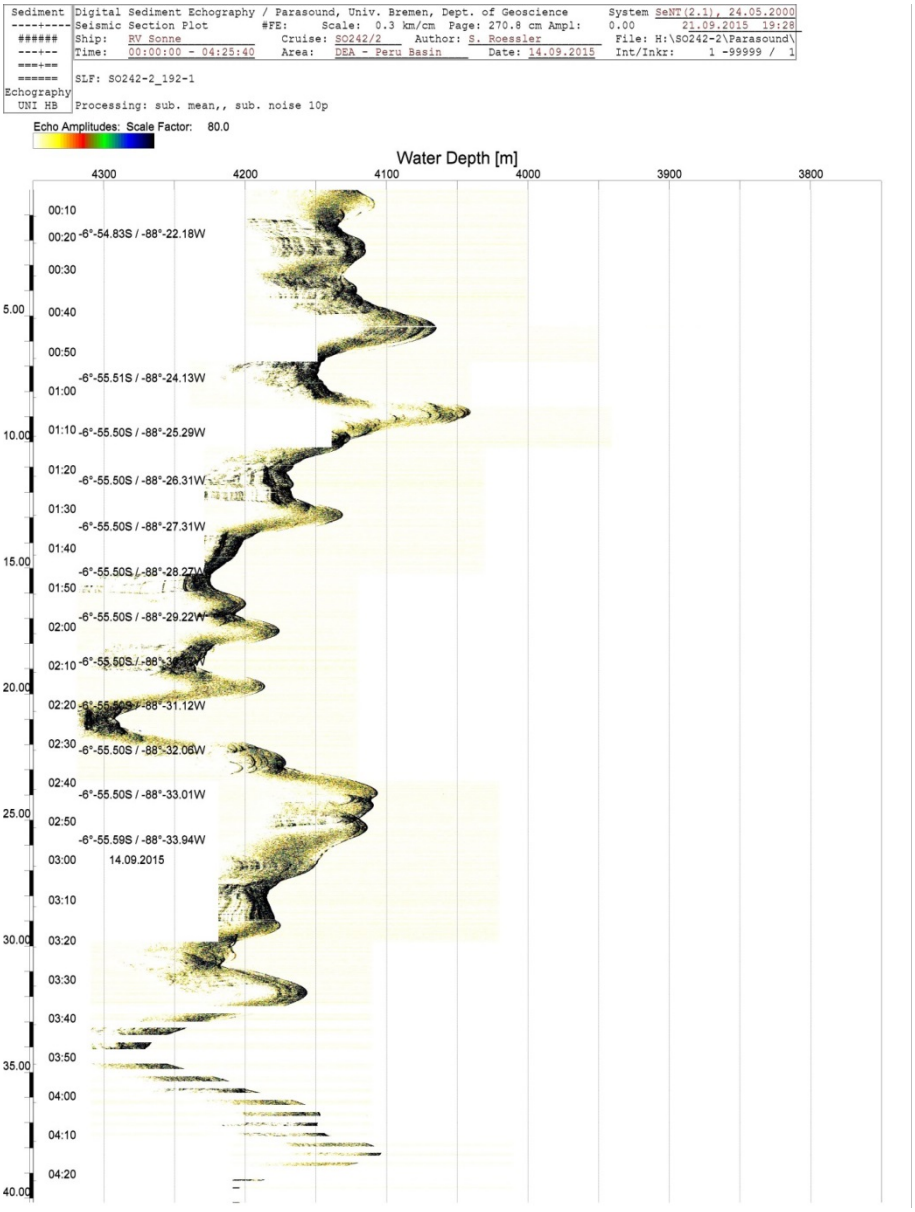


Figure 11.C.32. Profile SLF_SO242-2_192-1_02.

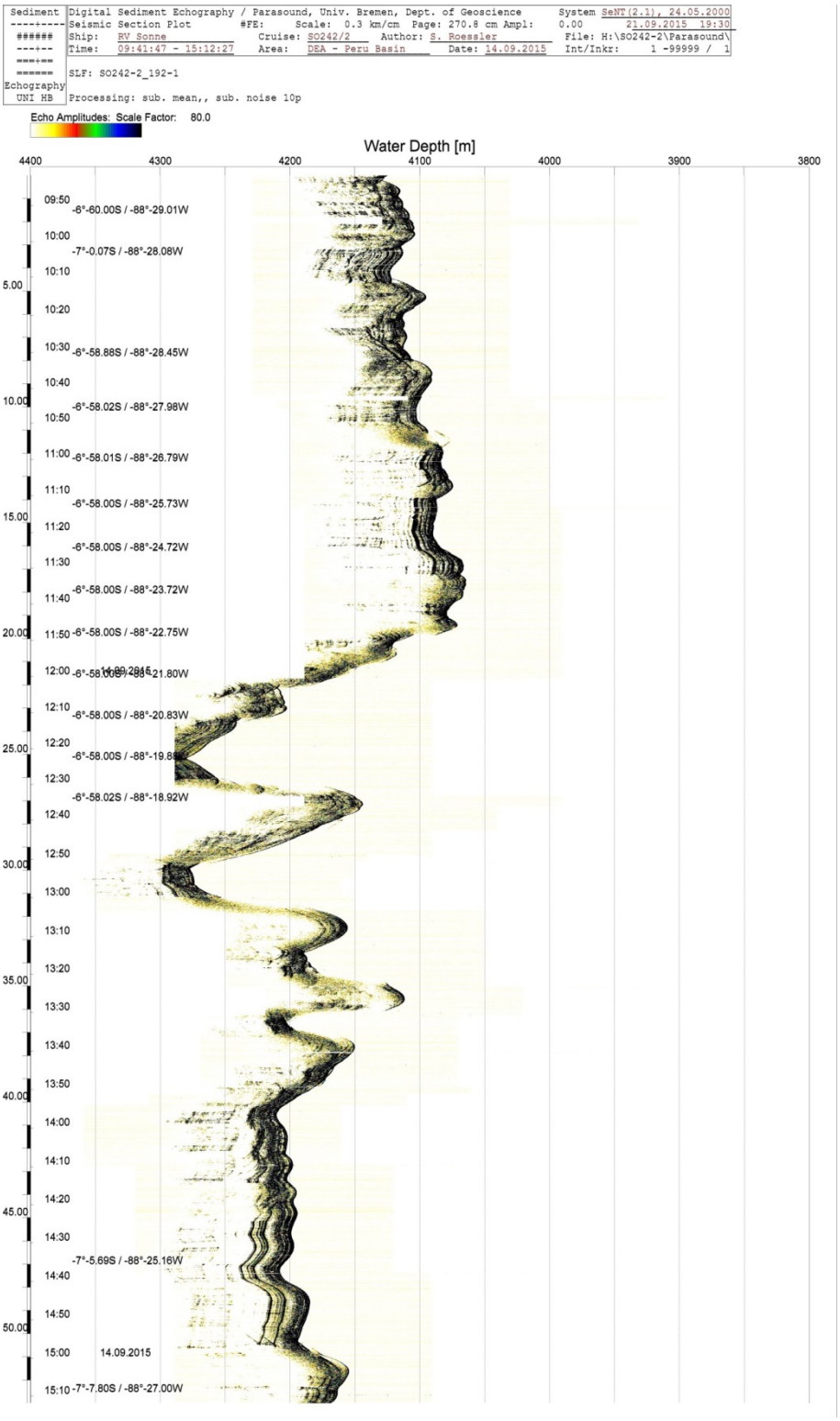


Figure 11.C.33. Profile SLF_SO242-2_192-1_03.

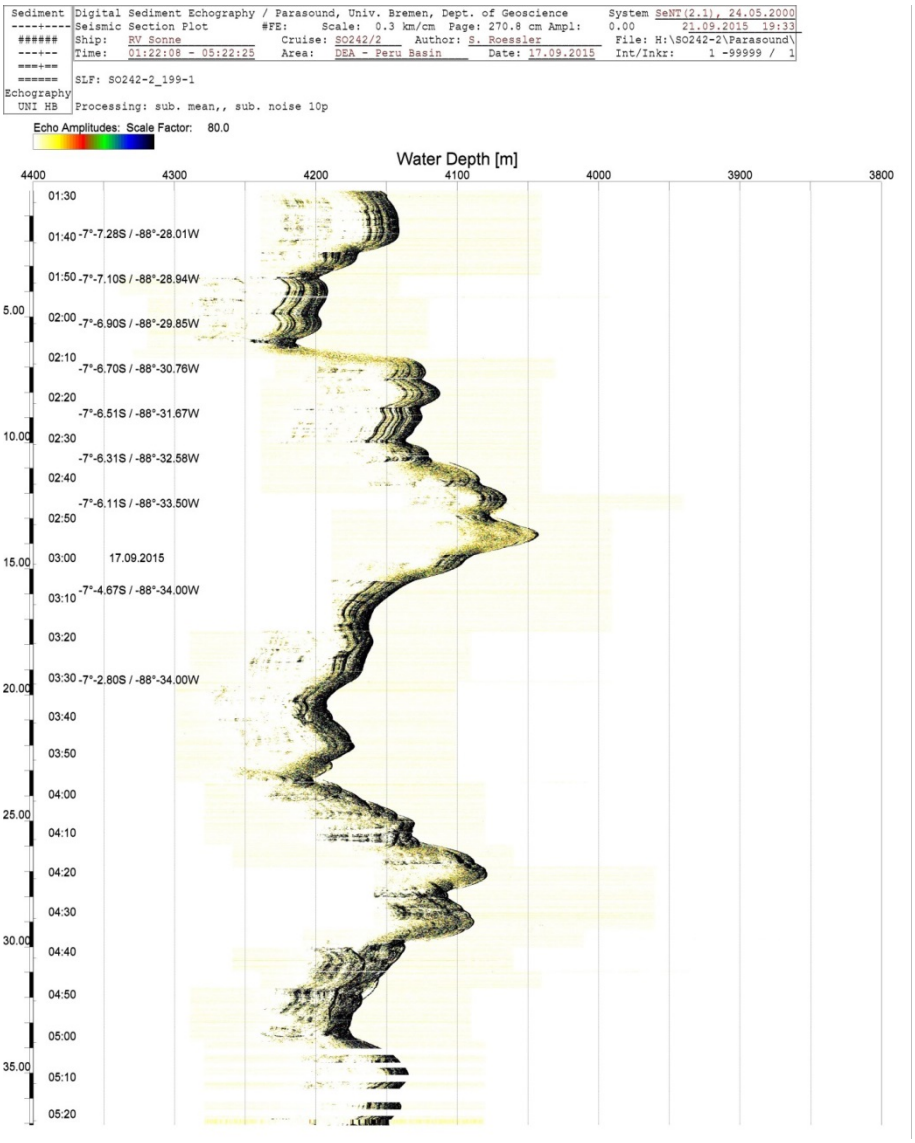


Figure 11.C.34. Profile SLF_SO242-2_199-1.

11.D Core samples /Proben (MUC and PC Core descriptions)

J Barz, J Bäger, A Bleyer, M Haeckel, L Mevenkamp, S Paul

All core images will be available via 'Pangaea' in maximum image resolution from January 2016. Link: http://doi.pangaea.de/10.1594/PANGAEA.855496

11.D.1 Core Photos Geochemistry

Below the photographs of all cores analyzed by the geochemistry group are compiled in order according to the different study sites. Coordinates are given in Table 7.7.2.

Table 11.D.1.1. *Plough mark site in western DEA*

Outside (undisturbed)	White patch	Ripple crest	Ripple valley
			
146 ROV PUC 79	142 ROV PUC 48	142 ROV PUC 33	146 ROV PUC 77
(0 – 18 cm)	(0 – 18 cm)	(0 – 22 cm)	(0 – 17 cm)

Table 11.D.1.2. *Plough mark site in eastern DEA*

Outside (undisturbed)	White patch	Ripple crest	Ripple valley
			
166 ROV PUC 70	169 ROV PUC 83	163 ROV PUC 83	166 ROV PUC 69
(0 – 16 cm)	(0 – 11 cm)	(0 – 20 cm)	(0 – 22 cm)

Table 11.D.1.3 *Plough mark site in southern DEA*

Outside (undisturbed)	White patch	Ripple crest	Ripple valley
			
229 MUC	219 ROV PUC 58	232 ROV PUC 64	219 ROV PUC 75
(0 – 39 cm)	(0 – 18 cm)	(0 – 20 cm)	(0 – 17 cm)

Table 11.D.1.4 *EBS track site in western DEA*

Outside	side pile	inside	rim inside

(undisturbed)			
			
211 ROV PUC 73	202 ROV PUC 18	202 ROV PUC 80	211 ROV PUC 52
(0 – 15 cm)	(0 – 19 cm)	(0 – 21 cm)	(0 – 20 cm)

11.D.2Meiofauna cores

Below are images of all the cores collected for meiofauna analysis, by both PC and MUC. Each core is identified by station number and core number. Where appropriate, two images of particular cores are given. See chaper 7.9 for further information.

Table 11.D.2. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

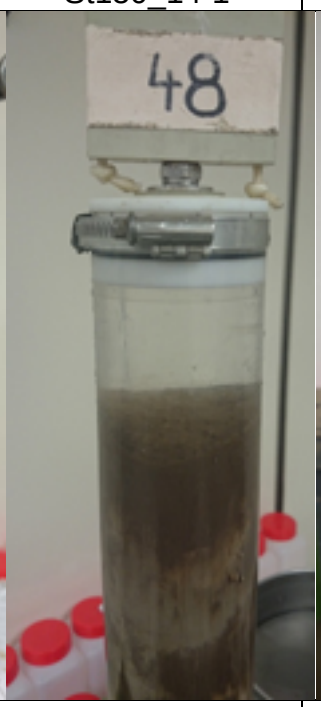
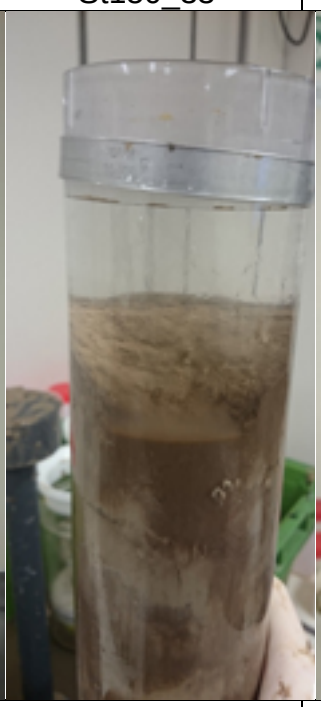
			
St150_12-1	St150_14-1	St150_33	St150_34-1
			
St150_34-2	St150_48-1	St150_55-1	St150_55-2

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

			
St154_25-1	St154_25-2	St154_32-1	St154_32-2
			
St154_71-1	St154_71-2	St154_83-1	St154_83-2

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

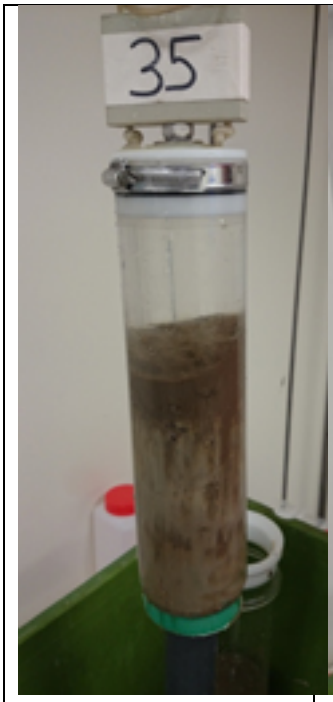
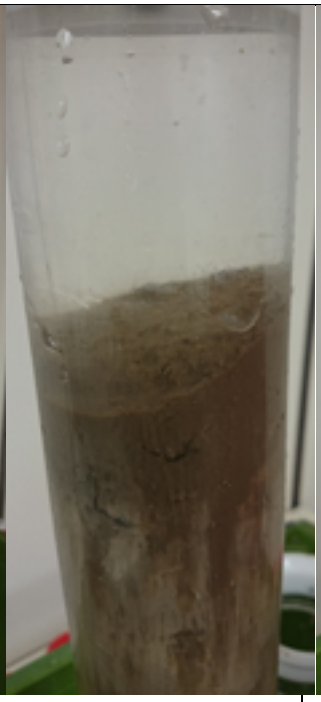
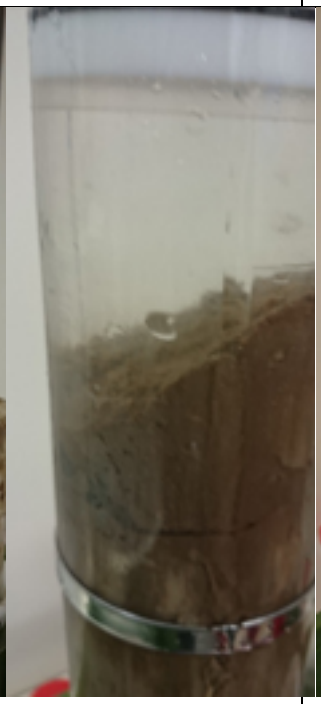
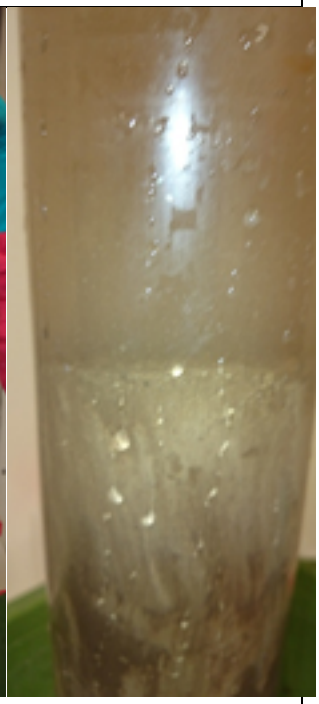
			
St163_35-1	St163_35-2	St163_46-1	St163_46-2
			
St163_53-1	St163_53-2	St169_34-1	St169_34-2

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

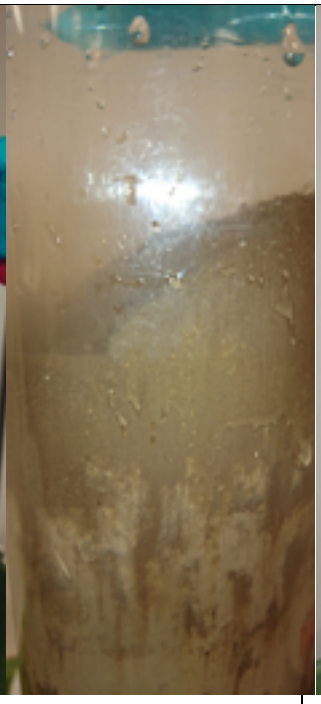
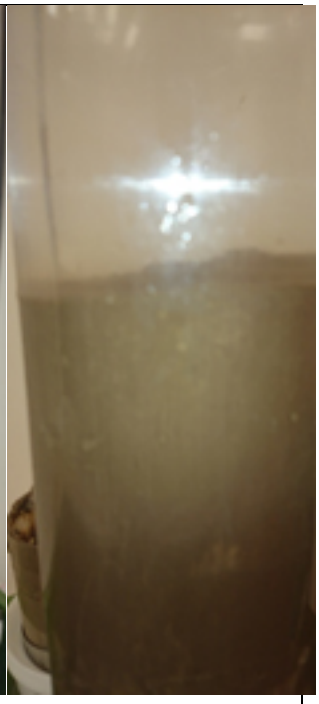
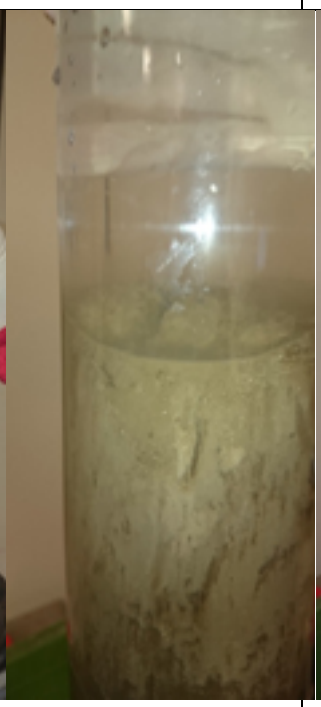
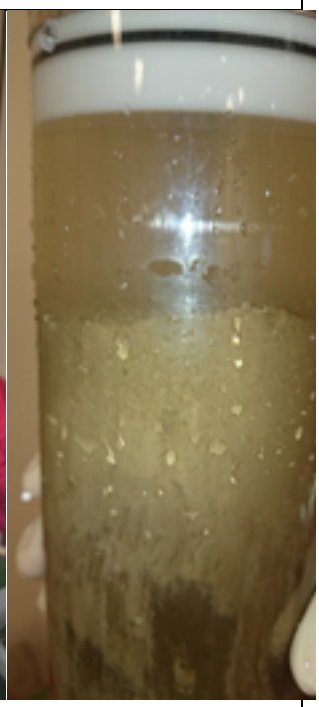
			
St169_38-1	St169_38-2	St169_79-1	St169_79-2
			
St176_58-1	St176_58-2	St176_76-1	St176_76-2

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

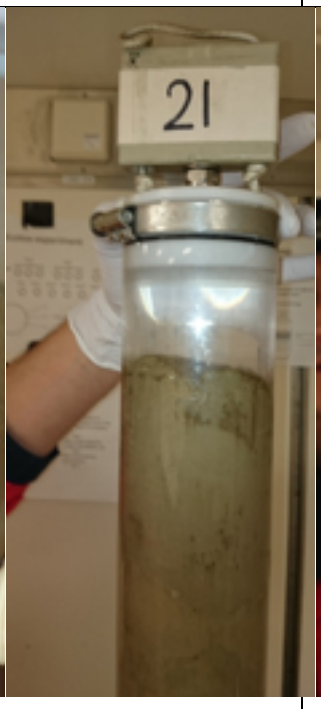
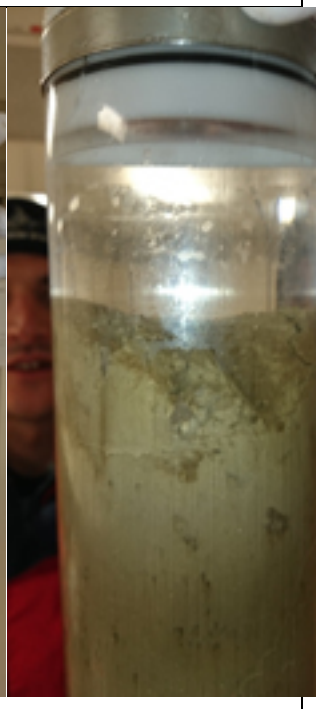
			
St179_60-1	St179_60-2	St179_67-1	St179_67-2
			
St179_81-1	St179_81-2	St205_21-1	St205_21-2

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

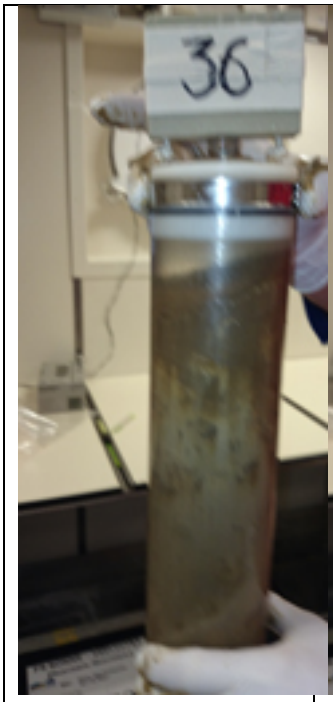
			
St205_36-1	St205_36-2	St205_36-3	St205_48-1
			
St205_48-2	St205_51-1	St205_51-2	St205_68-1

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

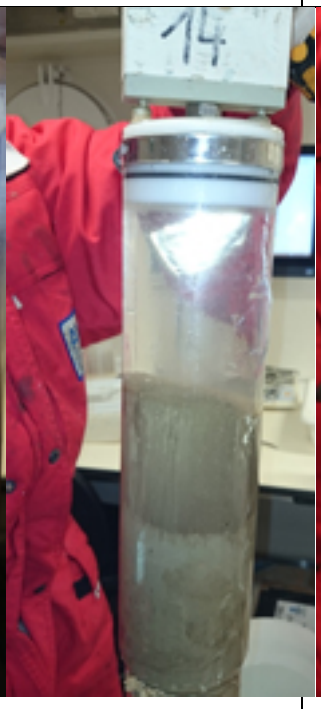
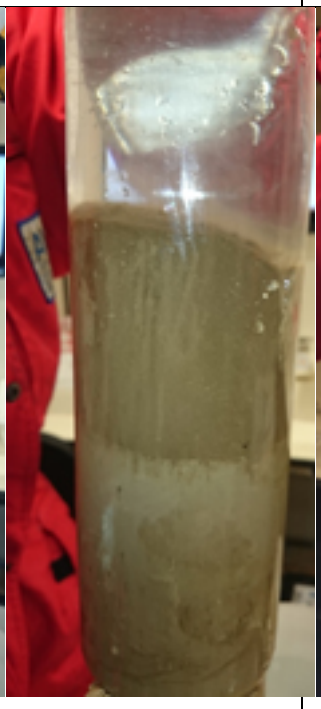
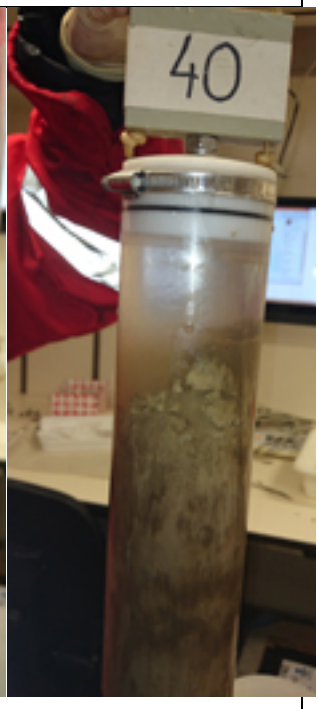
			
St205_68-2	St205_68-2	St205_71-1	St205_71-2
			
St205_71-3	St222_14-1	St222_14-2	St222_40-1

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

			
St222_40-2	St222_62-1	St222_62-2	St222_65-1
			
St222_65-2	St222_83-1	St222_83-2	St232_17-1

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

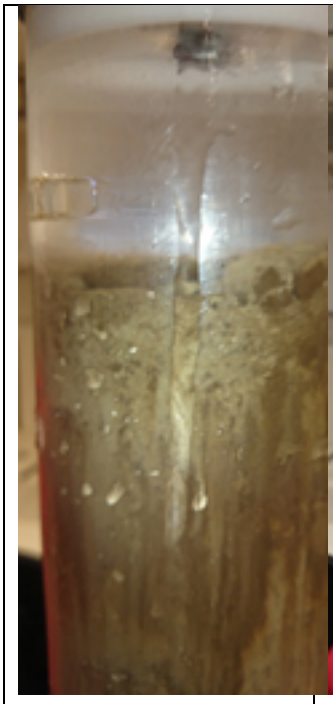
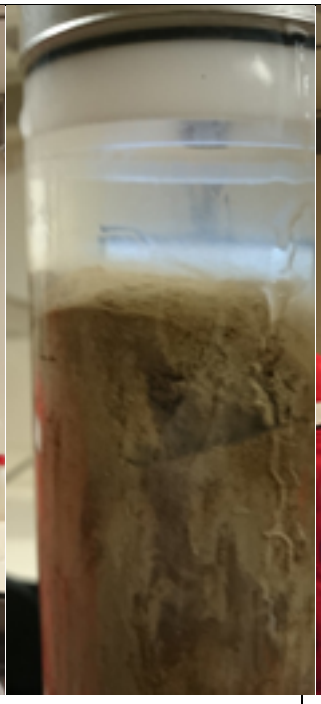
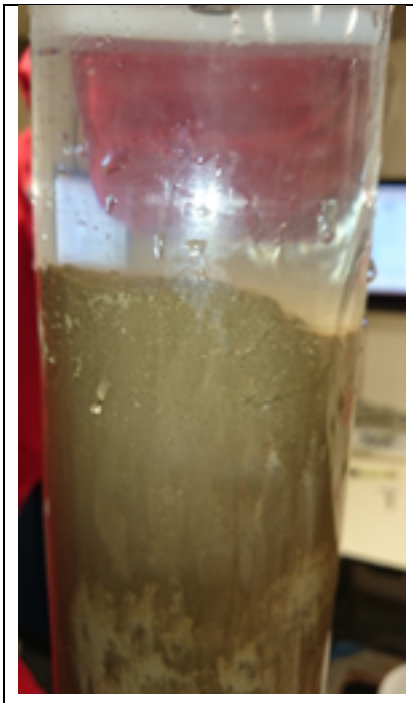
			
St232_17-2	St232_56-1	St232_56-2	St232_65-1
			
St232_65-2	St232_72-1	St232_72-2	St232_74-1

Table 11.D.2 ctd. *PC and MUC cores taken for Meiofauna analysis during SO242-2.*

		
St232_74-2	St232_82-1	St232_82-2

11.D.3 Core Photos Microbiology

SO242-1 34 MUC X-Ray core

SO242-1 110 MUC X-Ray core

SO242-1 119 MUC X-Ray core

Figure 11.D.1. *Cores collected during SO242-1 processed during SO242-2.*

Table 11.D.3. *Microbiology cores taken during SO242-2.*

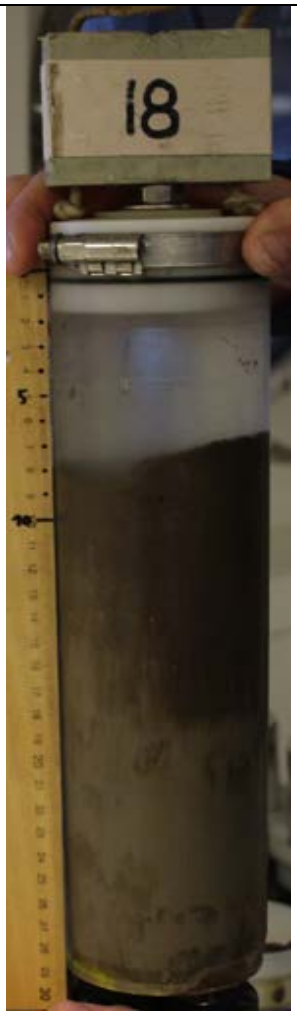
			
141 ROV PUC 12	141 ROV PUC 14	141 ROV PUC 18	141 ROV PUC 24

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

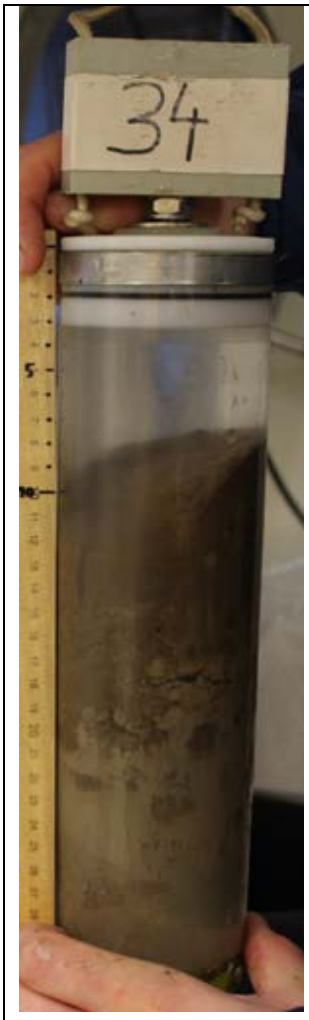
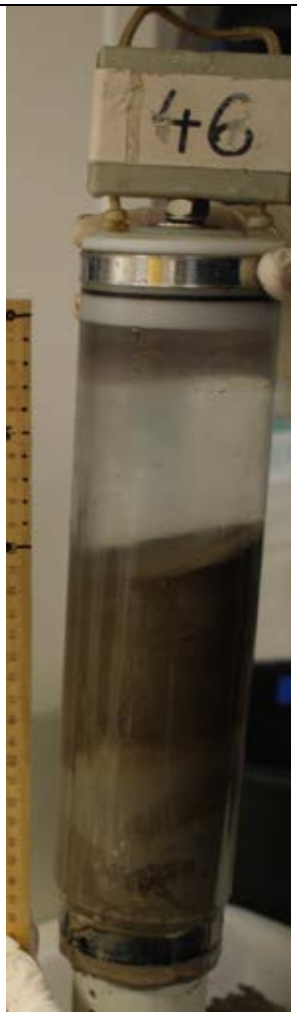
			
141 ROV PUC 34	141 ROV PUC 45	141 ROV PUC 46	141 ROV PUC 53

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

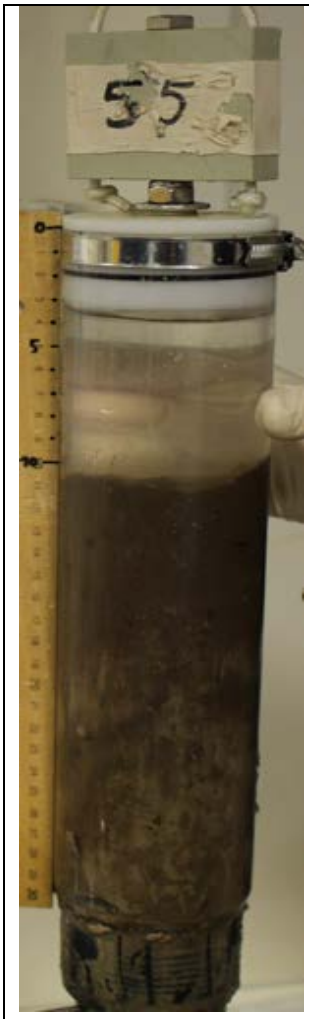
			
141 ROV PUC 55	146 ROV PUC 49	146 ROV PUC 59	146 ROV PUC 56

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
146 ROV PUC 57	146 ROV PUC 59	146 ROV PUC 62	146 ROV PUC 66

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
146 ROV PUC 73	146 ROV PUC 74	146 ROV PUC 82	146 ROV PUC 83

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
147 MUC Core 3	147 MUC Core 9	148 MUC Core 3	148 MUC Core 6

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

 Only image			
148 MUC Core 9	148 MUC Core 10	148 MUC Core 12	151 MUC Core 3

			
151 MUC Core 4	151 MUC Core 5	151 MUC Core 6	151 MUC Core 7

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
151 MUC Core 8	150 ROV PUC 9	150 ROV PUC 13	150 ROV PUC 18

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
150 ROV PUC 23	150 ROV PUC24	150 ROV PUC 45	150 ROV PUC 46

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
150 ROV PUC 53	150 ROV PUC 80	154 ROV PUC EXTRA 57	154 ROV PUC 20 X-RAY

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

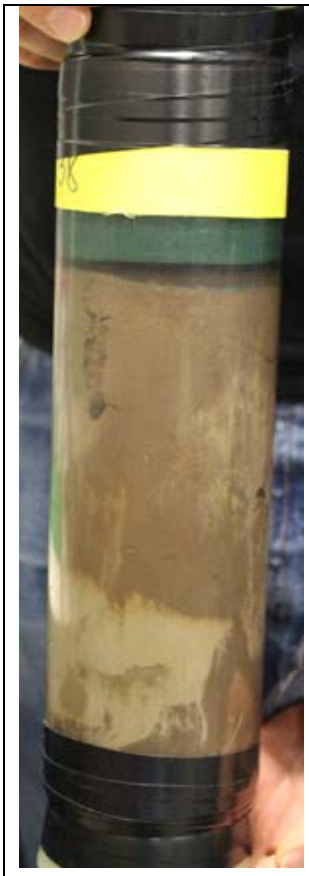
			
54 ROV PUC 38 X-RAY	154 ROV PUC 49	154 ROV PUC 50	154 ROV PUC 56 X-RAY

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
154 ROV PUC 58	154 ROV PUC 59	154 ROV PUC 62	154 ROV PUC 73

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
154 ROV PUC 74 X-RAY	154 ROV PUC 76	154 ROV PUC 77	154 ROV PUC 82

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
163 ROV PUC 80 X-RAY	163 ROV PUC 09	163 ROV PUC 13	163 ROV PUC 18

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
163 ROV PUC 20	163 ROV PUC 24	163 ROV PUC 33	163 ROV PUC 55

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

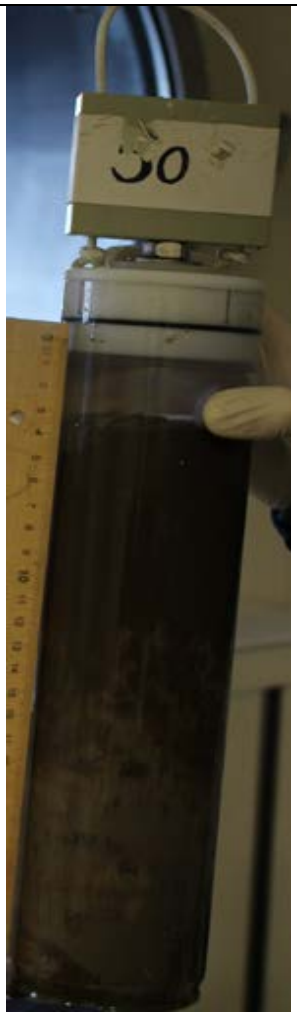
			
163 ROV PUC 74	163 ROV PUC 79	166 ROV PUC 50	166 ROV PUC 56

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

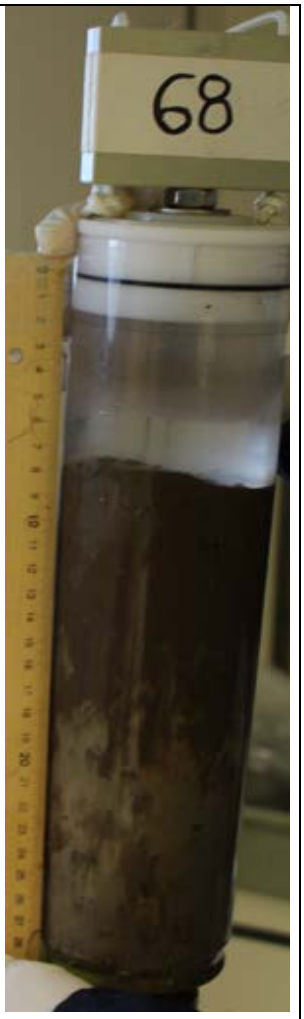
			
166 ROV PUC 58	166 ROV PUC 59	166 ROV PUC 66	166 ROV PUC 68

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
166 ROV PUC 72	166 ROV PUC 73 X-RAY	166 ROV PUC 75	166 ROV PUC 77

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
169 ROV PUC 09	169 ROV PUC 18	169 ROV PUC 20	169 ROV PUC 24

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
169 ROV PUC 33	169 ROV PUC 49	169 ROV PUC 55	169 ROV PUC 57

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

 Only image			
169 ROV PUC 67	176 ROV PUC 38	176 ROV PUC 50	176 ROV PUC 56

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
176 ROV PUC 70	176 ROV PUC 72	176 ROV PUC 73 X-RAY	176 ROV PUC 75

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
176 ROV PUC 77	176 ROV PUC 82	179 ROV PUC 09 X-RAY	194 MUC Core 1

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
194 MUC Core 2	194 MUC Core 3	194 MUC Core 4	194 MUC Core 5

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
194 MUC Core 6	194 MUC Core 7	194 MUC Core 8	194 MUC Core 9

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
194 MUC Core 10	194 MUC Core 11	194 MUC Core12	202 ROV PUC 9

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
202 ROV PUC 17	202 ROV PUC 33	202 ROV PUC 49 X-RAY	202 ROV PUC 52

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
202 ROV PUC 57	202 ROV PUC 60	202 ROV PUC 65	202 ROV PUC 69

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
202 ROV PUC 74	202 ROV PUC 76	205 ROV PUC 31 X-RAY	205 ROV PUC 35 X-RAY

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
208 MUC Core 1	208 MUC Core 2	208 MUC Core 3	208 MUC Core 4

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
208 MUC Core 5	208 MUC Core 6	208 MUC Core 7	208 MUC Core 8

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
208 MUC Core 9	208 MUC Core 10	208 MUC Core 11	211 ROV PUC 5

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
211 ROV PUC 17	211 ROV PUC 25	211 ROV PUC 32	211 ROV PUC 33

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
211 ROV PUC 35	211 ROV PUC 37	211 ROV PUC 60	211 ROV PUC 65

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
211 ROV PUC 69	211 ROV PUC 74	213 RPV PUC 10 X-RAY	219 ROV PUC 10

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
219 ROV PUC 20	219 ROV PUC 21	219 ROV PUC 30	219 ROV PUC 36

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

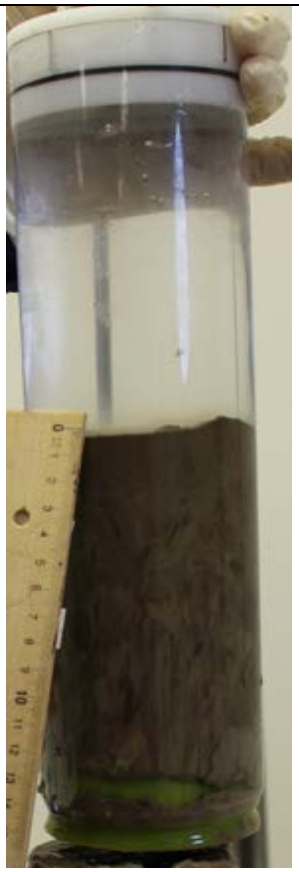
			
219 ROV PUC 48	219 ROV PUC 51	219 ROV PUC 61	219 ROV PUC 67 X-RAY

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

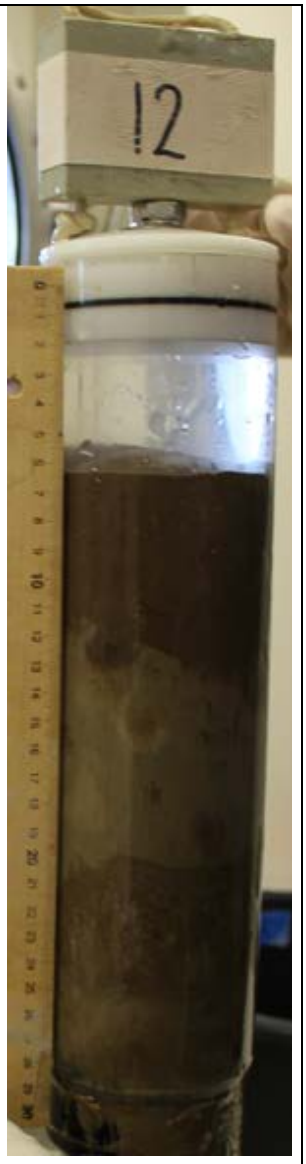
			
219 ROV PUC 70	219 ROV PUC 77	222 ROV PUC 5	222 ROV PUC 12

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

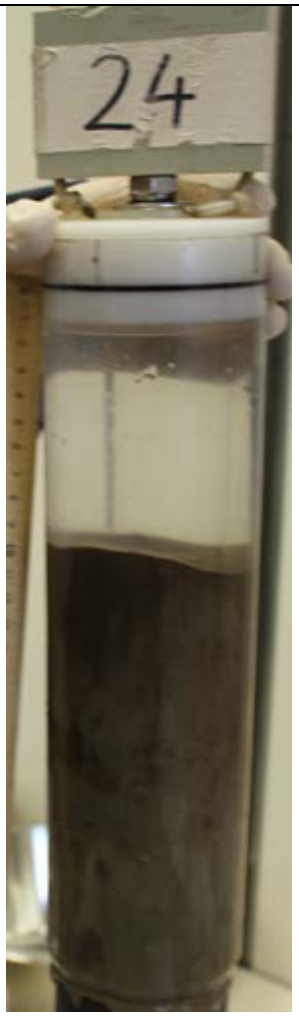
			
222 ROV PUC 22	222 ROV PUC 24	222 ROV PUC 25	222 ROV PUC 34

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

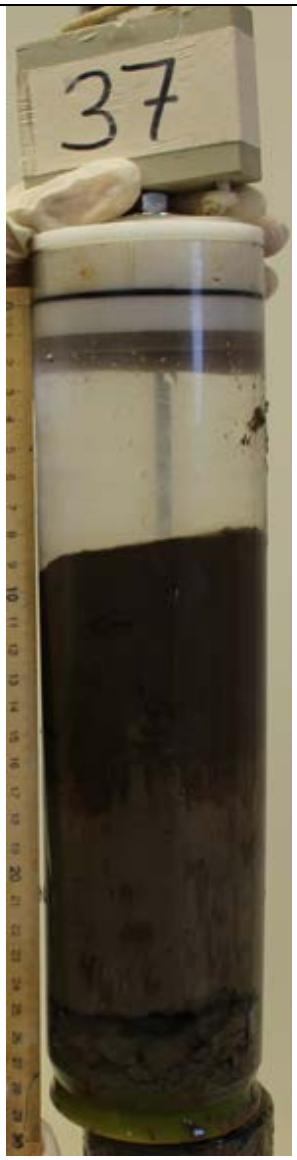
			
222 ROV PUC 35	222 ROV PUC 37	222 ROV PUC 47	229 MUC Core 1

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

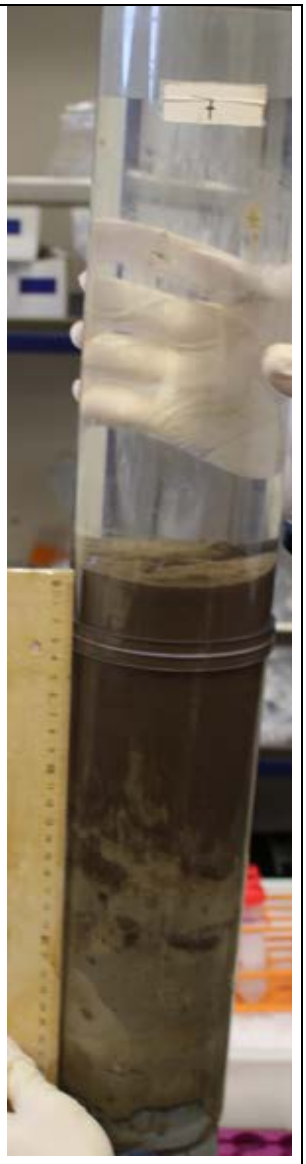
			
229 MUC Core 2	229 MUC Core 5 X-RAY	229 MUC Core 6	229 MUC Core 7

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
229 MUC Core 8	229 MUC Core 9	229 MUC Core 10	229 MUC Core 11

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
232 ROV PUC 23	232 ROV PUC 36	232 ROV PUC 49 X-RAY	232 ROV PUC 50

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
232 ROV PUC 51	232 ROV PUC 52	232 ROV PUC 53 X-RAY	232 ROV PUC 59

Table 11.D.3 continued. *Microbiology cores taken during SO242-2.*

			
232 ROV PUC 66	232 ROV PUC 70	232 ROV PUC 71	

11.E. Selected Pictures of samples / ausgewähltes Bildmaterial der Beprobung

11.E.1 Selected images of seafloor fauna recorded by OFOS camera

Figure 11.E.1. *Two images of Probeebei mirabilis crustacean. An anemone is attached to the rear of the animal in the lower picture… A common association observed in the DISCOL area. The upper image contains three lazer points, with a spacing of 50 cm.*

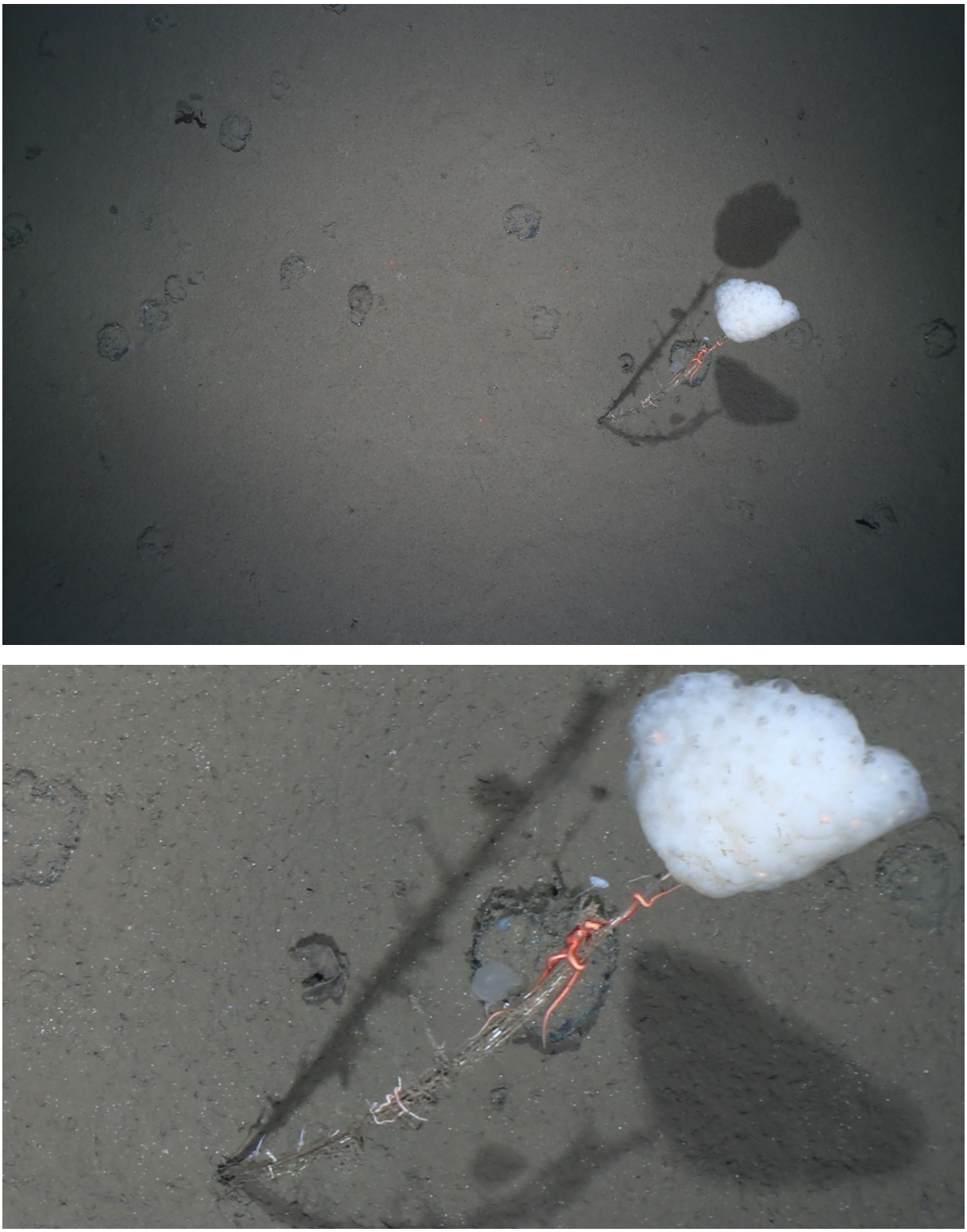


Figure 11.E.2. *Two images of a stalked sponge. Various ophiuroids, amphipods and other fauna are utilising the stalk as a substrate. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.3. *Two isopods utilising a flat sponge. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.4. *Various fauna utilising a stalk. Various mushroom shaped sponges are surrounded by ophiuroids and amphipods. Several sizable burrows are present in the sediment and sponges encrust some of the visible nodules. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.5. *A deep sea sponge has hydrodynamically trapped a dead salp. An ophiuroids can just be seen below the sponge. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.6. *Two holothurians are occupying the central region of a plough track. The upper image contains three lazer points, with a spacing of 50 cm.*

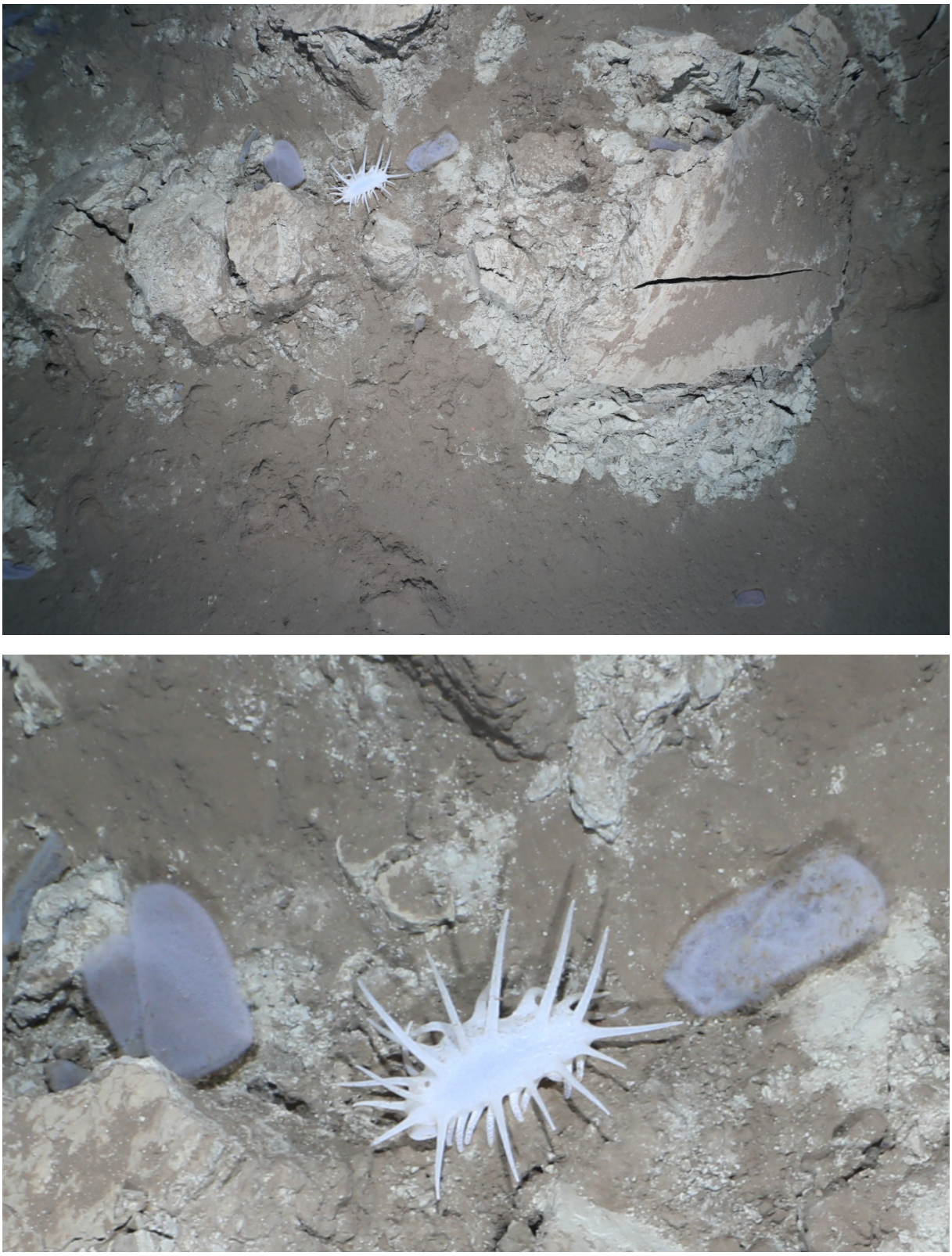


Figure 11.E.7. *A Deimatidae* mtp*. Holothurian can be seen within the broken blocks of sediment generated by a recent epibenthic sled trawl. Several dead salps have fallen from suspension within the block structure. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.8. *An unknown asteroidea is moving within a plough mark.The upper image contains three lazer points, with a spacing of 50 cm.*

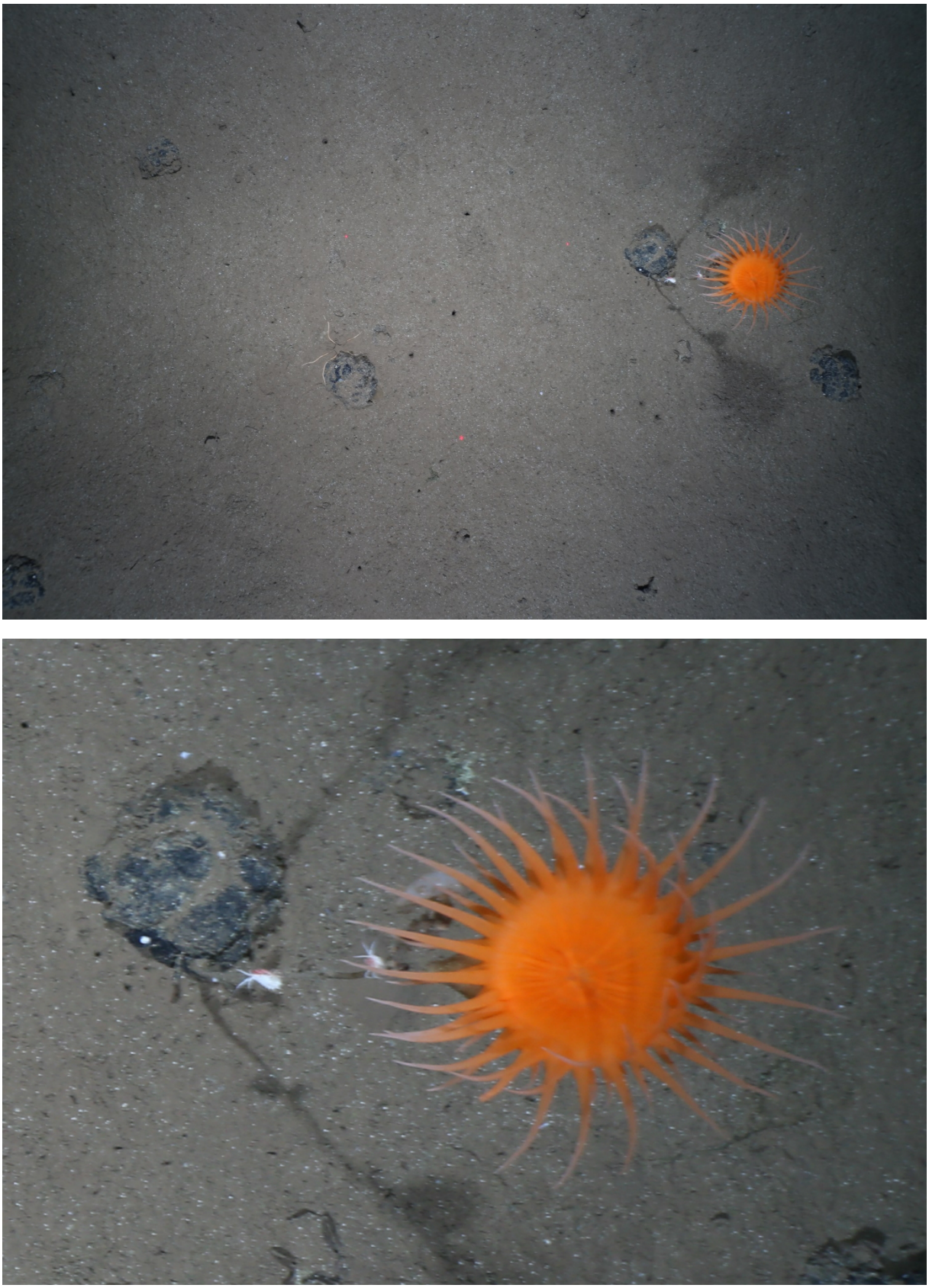


Figure 11.E.9. *An unknown anemone and several amphipods are utilising a dead stalk. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.10. *An unknown anemone and several amphipods are utilising a dead stalk. A holothurian is visible to the upper right. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.11. *A Dyaster* mtp. *Asteroid and an unkidentified ophiuroid are visible on the sediment surface. The asteroid is close to a trapped salp carcass. A Bathysaurus sp. fish is resting on the seafloor. The upper image contains three lazer points, with a spacing of 50 cm.*

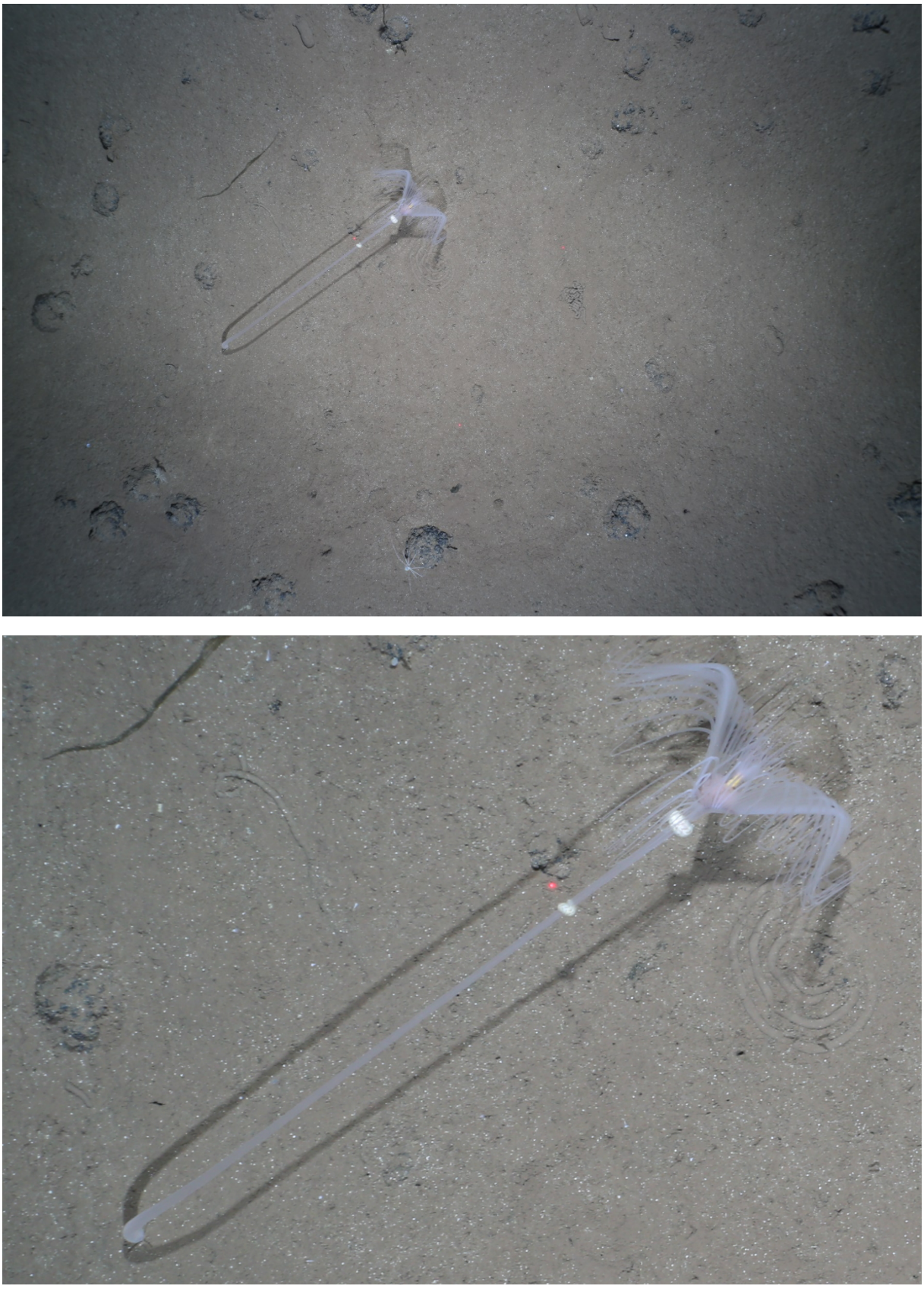


Figure 11.E.12. *An unidentified hydrozoan has been occupied by several scaleworms. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.13. *A Lophoenteropneusta* mtp. hemicordate is visibly producing its distinctive waste trail*… common features of the DISCOL seafloor. The upper image contains three lazer points, with a spacing of 50 cm.*

Figure 11.E.14. *A stalked crinoid is heavily occupied by a range of amphipods. The upper image contains three lazer points, with a spacing of 50 cm.*

11.E.2 Selected images of megafauna collected during the SO242-2 cruise

Figure 11.E.15 *Probeebei mirabilis directly collected from the seafloor via ROV. The unknown*

anemone often observed in association with the crustacean was recovered still attached. (Photo: K Hamann)

Figure 11.E.16 *Various isopods were collected directly with the ROV 'slurp' gun, either intentionally or wilst attached to sponges / crinoids etc. (Photo: K Hamann)*

Figure 11.E.217 *Various nodules were collected by ROV. In many cases these were encrusted by small fauna, such as the serpulid worms, sponges and crinoid visible on this nodule. (Photo: A Purser)*

F) Selected pictures from Shipboard Operations / ausgewähltes Bildmaterial von Bord

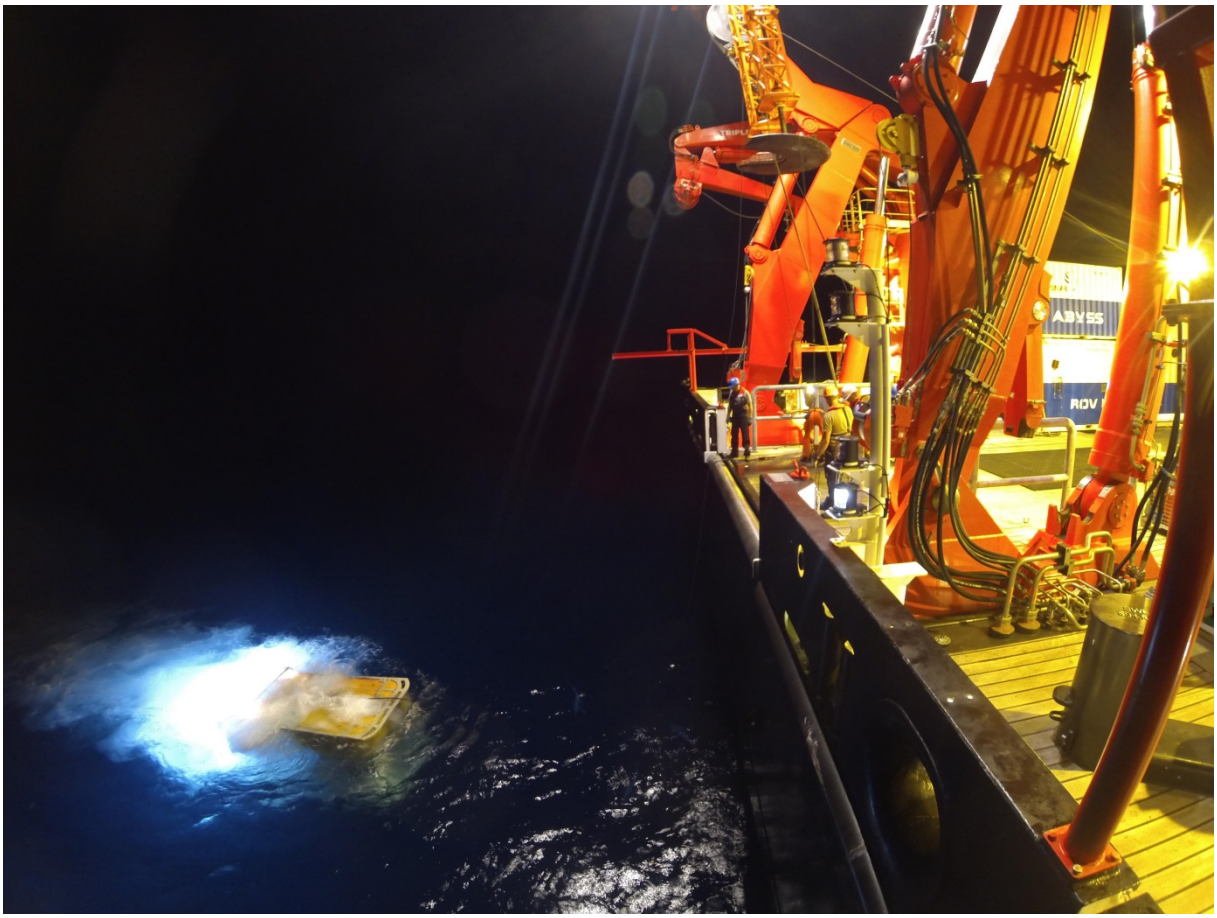


Figure 11.F.1. *ROV Kiel 6000 returning to surface in the early evening. (Photo: J Lemburg).*

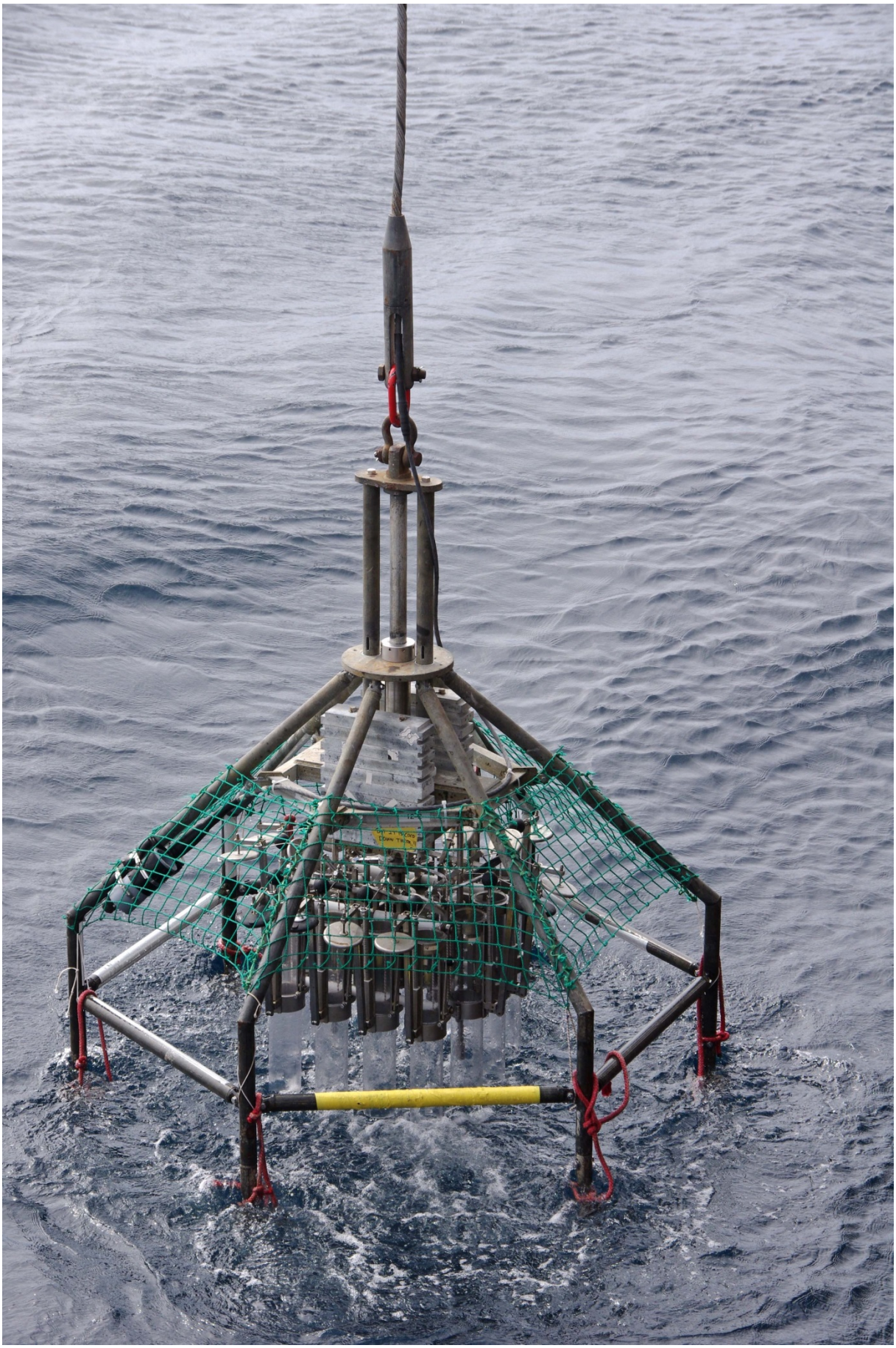


Figure 11.F.2. *MUC Multicorer preparing at surface for deployment. (Photo: J Lemburg).*

Figure 11.F.3. *Lander being deployed in the evening. (Photo: J Lemburg).*

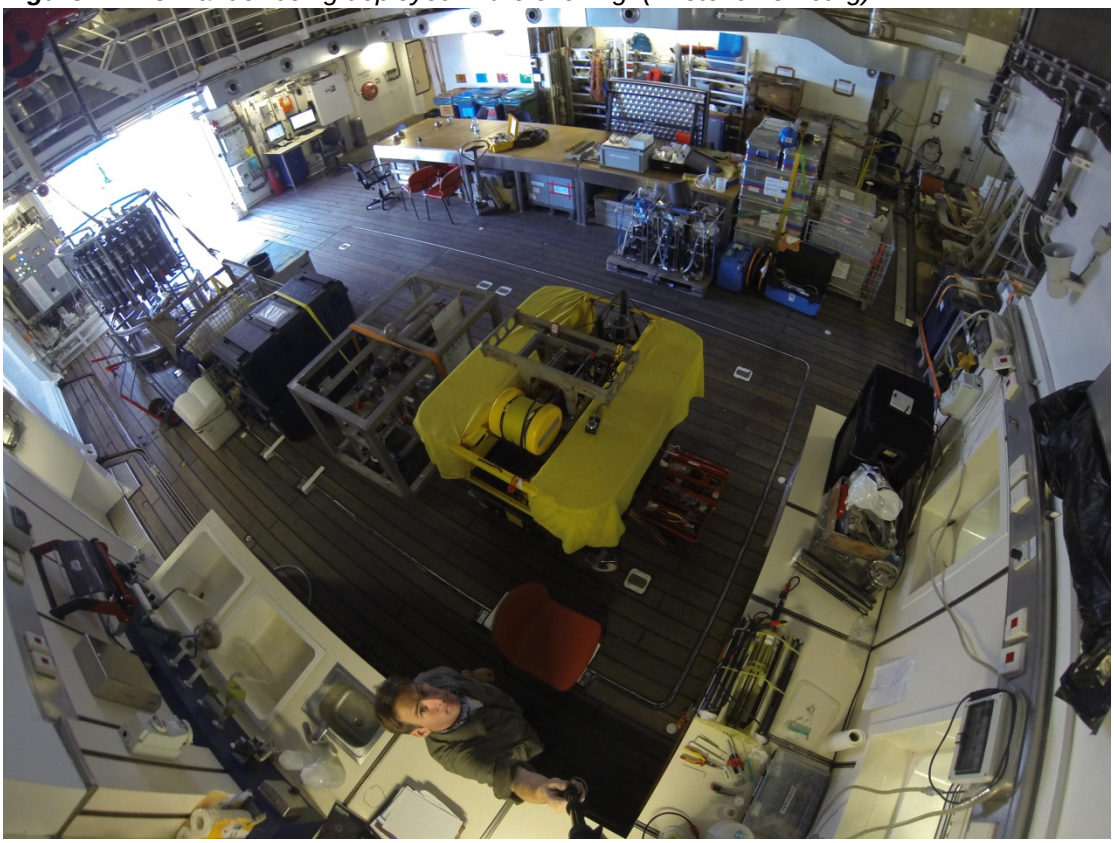


Figure 11.F.4. *Hangar filled with various pieces of equipment – The ROBEX 'Tramper' crawler in the foreground, with the OFOS Launcher, ROV equipment, CTD array and in situ profilers also visible. (Photo: J Lemburg).*

Figure 11.F.5. *F Jannsen and C Wigand calibrating and preparing profilers before deployment. (Photo: J Lemburg).*

Figure 11.F.6. *ROV Kiel 6000 push cores on deck and being prepared for analysis. (Photo: J Lemburg).*

Figure 11.F.7. *Sediment core being sliced in the thermoconstant room. (Photo: R Schwarz).*

Figure 11.F.8. *ROV Kiel 6000 live feed available in the meeting room and on the ship TV network whenever the system was deployed. (Photo: R Schwarz).*

G) Detailed dive protocols

Dive summary

Kiel 6000 - Dive: 142-1

SO242/2 (RV Sonne)

Date: **31/08/2015**
Observers: **BOETIUS Antje, BROWN Alastair, HAECKEL Matthias, JANSSEN Felix, MARCON Yann, PURSER Autun, WENZHOEFER Frank**
Position: **S 07 04.4149 W 088 27.8522**

Dive duration:

Start: **31/08/2015 13:17:42**
At bottom: **31/08/2015 14:56:32**
Leave bottom: **31/08/2015 21:05:27**
End: **31/08/2015 22:47:32**

Explored sites:

Aims of the Dive:

1. Pushcoring disturbed track
2. Chamber respiration
3. animal collection

Required Tools:

1. KIPS
2. Suction pump
3. 16 pushcores
4. nets and animal collection tool
5. chamber
6. beacon
7. MAPER

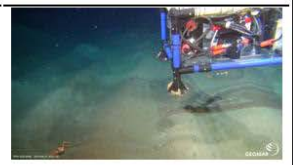
Dive summary:

Dive SO242-2_142 (protocol by Antje Boetius)
This dive explored the disturbed area of the DEA West. We started out by exploring one of the old plough tracks, to decide on microhabitats for sampling and in situ measurements. Ripples are clearly to be seen from the ploughing of the seafloor, with ripple crests and valleys, and in between some whitish spots that looked like the surface layer of sediment was eroded. We selected these three types of seafloor morphologies as microhabitats to be sampled, in comparison to the undisturbed area outside the track, which showed some partially sedimented nodules. We got the benthic chamber from the elevator, but unfortunately it sank in quite deep and the program did not start. We collected 14 pushcores from the ripple crests and 2 from the valley, placed marker 1 at the sampling spot, and were able to photograph the environment. Marker 2 was placed further away in the track. Another task was trying various sampling tools for fauna, especially holothurians. The KIPS sampler failed. We sampled fauna ....

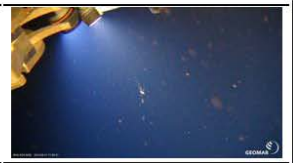
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
31/08/2015	14:56:32	DEA West Plough Track	S 07 04.4386 W 088 27.8778	4130.64	AT THE BOTTOM	No picture

31/08/2015	15:42:19	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	photo of plough structure track #1 experiment	
31/08/2015	15:42:51	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	photo of plough structure track #1 experiment	
31/08/2015	15:43:11	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	photo of plough structure track #1 experiment	
31/08/2015	15:44:13	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	close up of sediment between ripples track #1	
31/08/2015	15:44:28	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	photo of plough structure track #1 experiment	
31/08/2015	15:46:42	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	taking panorama view of ripple structure track #1	No picture
31/08/2015	15:46:43	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	taking panorama view of ripple structure track #1	
31/08/2015	15:46:57	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	taking panorama view of ripple structure track #1	
31/08/2015	15:47:08	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.66	taking panorama view of ripple structure track #1	
31/08/2015	15:47:32	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.7	taking panorama view of ripple structure track #1	

31/08/2015	15:55:10	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.6	Lower HD rec. on	No picture
31/08/2015	16:03:38	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.7	ChamberX on ripples of plough track area #1, program does not start, chamber sinks to deep	
31/08/2015	16:14:33	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.7	place beacon68 next to chamber	No picture
31/08/2015	16:25:58	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.8	ripple 1 and 2 to be sampled by pushcoring	
31/08/2015	16:40:16	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.88	PC taken on top of ripple 1: 18, 46, 23, 33,	
31/08/2015	16:40:37	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.9	PC taken on top of ripple 1: 18, 46, 23, 33, 34	
31/08/2015	16:41:38	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.9	PCs taken on top of ripple 2: 12, 14, 53, 55, 24	
31/08/2015	16:55:06	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.9	photo from sediment after PCs have been pulled out	
31/08/2015	16:58:46	DEA West Plough Track	S 07 04.4101 W 088 27.8337	4138.9	1 more PCs on top of ripple 2: 45	
31/08/2015	17:25:54	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.7	1 PC in trough between ripples 1 + 2: 80 (photo taken), PCs in track	

					without dark sediment cover: 47, 48 (umgefallen, ausgespuelt), 13 (disturbed during deployment), 9	
31/08/2015	17:26:02	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.7	1 PC in trough between ripples 1 + 2: 80 (photo taken), PCs in track without dark sediment cover: 47, 48 (umgefallen, ausgespuelt), 13 (disturbed during deployment), 9	
31/08/2015	17:35:53	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.7	photo after pulling out PCs	
31/08/2015	17:36:01	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.7	photo after pulling out PCs	
31/08/2015	17:38:55	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.8	Marker 1 for the disturbance in track with light colored patches	
31/08/2015	17:39:09	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.8	Marker 1 for the disturbance in track with light colored patches	
31/08/2015	17:40:19	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.8	water with particles	

31/08/2015	17:40:31	DEA West Plough Track	S 07 04.4115 W 088 27.8124	4140.8	water with particles	
31/08/2015	17:48:08	DEA West Plough Track	S 07 04.4069 W 088 27.7987	4141.5	seafloor disturbed	
31/08/2015	17:48:26	DEA West Plough Track	S 07 04.4069 W 088 27.7987	4141.5	seafloor disturbed	
31/08/2015	17:49:45	DEA West Plough Track	S 07 04.4069 W 088 27.7987	4141.5	Marker 2 between 2 tracks directly after crossing for maximum resettled sediment on top of unploughed	
31/08/2015	17:51:02	DEA West Plough Track	S 07 04.4069 W 088 27.7987	4141.5	crab with sponge	
31/08/2015	17:51:38	DEA West Plough Track	S 07 04.4069 W 088 27.7987	4141.5	crab	
31/08/2015	18:54:15	DEA West Plough Track	S 07 04.3600 W 088 27.8451	4139.7	holothurian spotted	
31/08/2015	19:01:49	DEA West Plough Track	S 07 04.3594 W 088 27.8431	4139.5	unknown object	
31/08/2015	19:02:15	DEA West Plough Track	S 07 04.3582 W 088 27.8439	4139.3	unknown object	

31/08/2015	19:02:36	DEA West Plough Track	S 07 04.3572 W 088 27.8444	4139.3	sample litter ?	
31/08/2015	19:08:04	DEA West Plough Track	S 07 04.3575 W 088 27.8412	4140.775	handnet operation	
31/08/2015	19:08:25	DEA West Plough Track	S 07 04.3575 W 088 27.8412	4140.8	violet holothurian at the porch, very actively moing and swimming	
31/08/2015	19:27:35	DEA West Plough Track	S 07 04.3647 W 088 27.8167	4141.8	red holothurian	
31/08/2015	19:35:33	DEA West Plough Track	S 07 04.3721 W 088 27.8008	4143.1	sample purple holothurian	
31/08/2015	20:52:40	DEA West Plough Track	S 07 04.4114 W 088 27.8335	4138.94	photo of plough structure with chamber	
31/08/2015	21:04:41	DEA West Plough Track	S 07 04.4114 W 088 27.8335	4139.48	chamber secured with rigmaster and scoop and manipulator to bring back up	No picture
31/08/2015	21:05:27	DEA West Plough Track	S 07 04.4115 W 088 27.8360	4133.9	OFF THE BOTTOM	No picture
31/08/2015	21:17:04	DEA West Plough Track	S 07 04.3900 W 088 27.8468	3712.42	Lower HD rec. off	No picture

created 18/09/2015 23:48:06

Dive summary

Kiel 6000 - Dive: 146-1

SO242/2 (RV Sonne)

Date: **01/09/2015**
Observers: **BOETIUS Antje, HAECKEL Matthias, MARCON Yann, MEVENKAMP Lisa, PURSER Autun, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 04.4149 W 088 27.8522**

Dive duration:

Start: **01/09/2015 14:23:36**
At bottom: **01/09/2015 15:10:25**
Leave bottom: **02/09/2015 00:34:40**
End: **02/09/2015 02:11:55**

Explored sites:

Aims of the Dive:

1. Pushcoring undisturbed area next to track
2. Chamber respiration
3. Profiler
4. testing of experimental set ups

Required Tools:

1. KIPS
2. Suction pump
3. MAPR
4. 16 pushcores
5. nets and animal collection tool
6. chamber on porch
7. Marker 3

On Elevator:

1. 2 Chamber
2. 2 Profiler
3. 1 Cube
4. 1 Corral
5. 1 Sediment dispenser
6. 1 Ekman grab

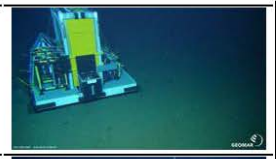
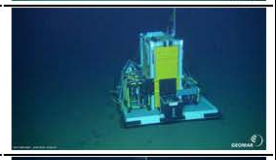
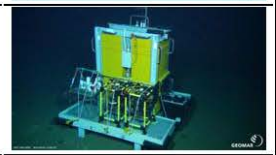
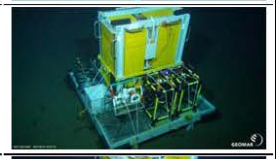
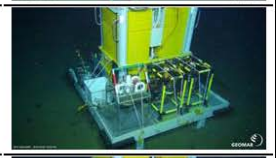
Dive summary:

Dive SO242-2_146 (protocol by Felix Janssen)
Dive 146 investigated the disturbed area of the DEA West with a focus on the microhabitats 'valley' and 'undisturbed outside track'. 2 Benthic chamber and 2 micro profiler modules of MPI/AWI were deployed (brought down with an elevator and on the porch of the ROV). A third benthic chamber did not work (i.e, the program was not running at all) and therefore taken back to the surface on the porch after the dive. The profilers were redeployed for a second replicate measurement at neighboring sites during the dive. One of the profilers was redeployed a second time but failed to produce data. In total 16 push cores were taken in the vicinity of the chamber and profiler deployments – 11 at undisturbed sediments off disturbance track and another 5 from valleys. In addition, bottom water in the track was sampled by an ROV Niskin Bottle. Other tasks were to test sediment sampling with a miniature Ekman Grab and to try out a custom-built sediment dispenser of Gent University. Unfortunately neither of the two instruments worked successfully.

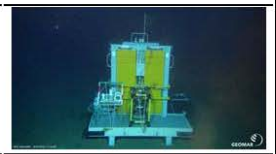
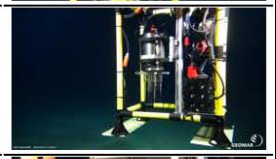
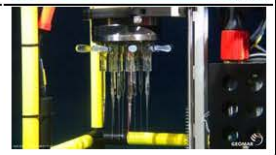
Dive report:

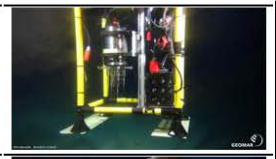
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
01/09/2015	15:10:25	DEA West Plough Track	S 07 04.4180 W 088 27.8510	4131.52	ROV AT THE BOTTOM	No picture

01/09/2015	15:11:49	DEA West Plough Track	S 07 04.4159 W 088 27.8503	4134.92	Lower HD on (upper HD is always recording anyway), will be recording for entire dive	No picture
01/09/2015	15:36:09	DEA West Plough Track	S 07 04.4099 W 088 27.8326	4137.4	flying to beacon 68 to look for a place to deploy chamber 3 (MPI ROV chamber, on porch)	No picture
01/09/2015	15:38:06	DEA West Plough Track	S 07 04.4091 W 088 27.8312	4139	Site where ROV chamber 3 of MPI/AWI ('chamber 3') is going to be placed	
01/09/2015	15:38:28	DEA West Plough Track	S 07 04.4092 W 088 27.8314	4139	Site where chamber 3 is going to be placed	
01/09/2015	15:39:43	DEA West Plough Track	S 07 04.4093 W 088 27.8318	4139	Strong sediment plume created	No picture
01/09/2015	15:45:39	DEA West Plough Track	S 07 04.4089 W 088 27.8292	4139	Chamber 3 is lowered to the deployment site	
01/09/2015	15:46:31	DEA West Plough Track	S 07 04.4096 W 088 27.8295	4139	Chamber 3 is lowered to the deployment site	
01/09/2015	15:47:23	DEA West Plough Track	S 07 04.4100 W 088 27.8300	4139	Chamber 3 is deployed in disturbance track on valley between ripples	
01/09/2015	15:56:00	DEA West Plough Track	S 07 04.4099 W 088 27.8306	4139	Chamber program start by magnet failed: optodes still record oxygen concentration in the chamber but samples are not taken.	No picture
01/09/2015	15:58:00	DEA West Plough Track	S 07 04.4102 W 088 27.8330	4139	Flying towards elevator 'OSCA' of GEOMAR ('elevator 1') to collect ROV micro profiler 1 of MPI/AWI ('profiler 1')	No picture
01/09/2015	16:00:34	DEA West Plough Track	S 07 04.4116 W 088 27.8343	4136.2	Elevator 1 hosts homer beacon #66	No picture

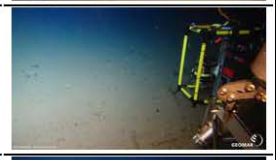
01/09/2015	16:05:29	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4137	Elevator 1, ROV profilers to the left, ROV chambers to the right	
01/09/2015	16:05:39	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4137	Elevator 1, ROV profilers to the left, ROV chambers to the right	
01/09/2015	16:06:25	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4136.84	Elevator 1, CUBE Incubation chamber of NIOZ / IRIS ('CUBE') to the left, profilers to the right	
01/09/2015	16:07:33	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4136.84	Elevator 1, CUBE to the left, profilers to the right	
01/09/2015	16:07:50	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4137	Elevator 1, CUBE to the left, profilers to the right	
01/09/2015	16:08:06	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4137.3	Elevator 1, CUBE to the left, profilers to the right	
01/09/2015	16:08:16	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4137.4	Elevator 1, CUBE to the left, profilers to the right	
01/09/2015	16:08:53	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4138.02	Elevator 1, CUBE to the left, profilers to the right	
01/09/2015	16:14:47	DEA West Plough Track	S 07 04.4488 W 088 27.8197	4138.5	Collecting profiler 1 from elevator 1	No picture
01/09/2015	16:18:45	DEA West Plough Track	S 07 04.4465 W 088 27.8202	4136.54	Flying towards beacon #68 / chamber 3 to place profiler 1	No picture
01/09/2015	16:22:02	DEA West Plough Track	S 07 04.4230 W 088 27.8255	4136.3	Side scan sonar image of track SO242 146	

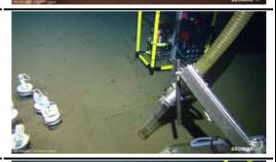
01/09/2015	16:30:02	DEA West Plough Track	S 07 04.4099 W 088 27.8306	4139	First site for deployment of profiler 1 selected	
01/09/2015	16:37:57	DEA West Plough Track	S 07 04.4099 W 088 27.8306	4139	Side scan sonar screenshot with chamber 3 on track 146	
01/09/2015	16:39:27	DEA West Plough Track	S 07 04.4099 W 088 27.8306	4138.6	Turbidity to strong to deploy profiler 1	No picture
01/09/2015	16:46:40	DEA West Plough Track	S 07 04.4055 W 088 27.8204	4138.3	Made a big plume that does not settle, try to reposition ROV	No picture
01/09/2015	16:48:24	DEA West Plough Track	S 07 04.4093 W 088 27.8331	4137.76	Track after plume has cleared	
01/09/2015	16:48:33	DEA West Plough Track	S 07 04.4093 W 088 27.8335	4137.84	Again a plume reduces visibility	
01/09/2015	16:49:36	DEA West Plough Track	S 07 04.4091 W 088 27.8346	4138.5	Track after plume has cleared	
01/09/2015	16:50:00	DEA West Plough Track	S 07 04.4090 W 088 27.8345	4138.5	Shifted ROV a bit to select site with less nodules	No picture
01/09/2015	16:50:32	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.56	ROV lands	No picture
01/09/2015	16:51:29	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Profiler 1 taken off the porch	
01/09/2015	16:53:17	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Profiler 1 positioned in disturbance track between ripples (valley)	
01/09/2015	16:54:08	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Profiler 1 sank about 5 cm into the sediment	No picture

01/09/2015	16:54:53	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Profiler 1 program started with magnet. Light indicates that program is running	No picture
01/09/2015	17:01:46	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Profiler 1 positioned at deployment site	
01/09/2015	17:04:52	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	Taking push core 28 in valley between ripples next to profiler 1	
01/09/2015	17:05:53	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.6	SAMPLE: SO242-2_D146_PUC28	
01/09/2015	17:10:01	DEA West Plough Track	S 07 04.4105 W 088 27.8328	4137.92	Flying back to elevator 1 to collect ROV micro profiler 2 of MPI/AWI ('profiler 2')	No picture
01/09/2015	17:15:48	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4137.5	Elevator 1, CUBE to the left, profiler 2 in the center	
01/09/2015	17:16:17	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4137.6	taking profiler 2 off elevator 1	No picture
01/09/2015	17:33:59	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	
01/09/2015	17:34:39	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	
01/09/2015	17:34:51	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	
01/09/2015	17:35:21	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	

01/09/2015	17:36:05	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	
01/09/2015	17:37:05	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler held by ROV manipulator while flying towards deployment site (undisturbed, off track)	
01/09/2015	17:42:48	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler 2 placed on the seafloor at undisturbed site off track	
01/09/2015	17:44:17	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler 2 after being pressed down by manipuator so it stands upright	
01/09/2015	17:45:07	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Profiler 2 program started with magnet. Light not working but turning gears indicate that program is running	No picture
01/09/2015	17:50:06	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Profiler 2 positioned at deployment site	
01/09/2015	17:50:18	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Profiler 2 positioned at deployment site	
01/09/2015	17:50:27	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Profiler 2 positioned at deployment site	
01/09/2015	17:50:47	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Profiler 2 positioned at deployment site	
01/09/2015	17:51:00	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Profiler 2 positioned at deployment site	

01/09/2015	17:51:33	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.6	Heading back to elevator 1 to collect ROV chamber of MPI/AWI	No picture
01/09/2015	18:00:59	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4138.4	ROV chamber 1 of MPI/AWI not flashing, i.e., not working. In the end of station 146 taken back up on porch.	No picture
01/09/2015	18:02:19	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4138.5	Taking ROV chamber 2 of MPI/AWI ('chamber 2') instead	No picture
01/09/2015	18:04:27	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4138.5	Elastic straps removed from chamber 2 on elevator 1	
01/09/2015	18:04:39	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4138.41667	lifting chamber 2 off elevator 1	No picture
01/09/2015	18:06:50	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4135.91667	ROV flying towards deployment site of chamber 2 (off track undisturbed, near profiler 2)	No picture
01/09/2015	18:09:51	DEA West Plough Track	S 07 04.4133 W 088 27.8280	4136	Crossing disturbance tracks	No picture
01/09/2015	18:13:03	DEA West Plough Track	S 07 04.4039 W 088 27.8269	4138.48	Unintendedly creating turbidity upon shaking chamber 2 to remove water trapped in other water layers from chamber	No picture
01/09/2015	18:19:08	DEA West Plough Track	S 07 04.3998 W 088 27.8274	4137.6	Arriving at profiler 2 in very turbid water	No picture
01/09/2015	18:20:06	DEA West Plough Track	S 07 04.3997 W 088 27.8265	4137.5	Trying to land left to profiler 2 - complicated because one ROV propeller is temporarily not working	No picture
01/09/2015	18:26:07	DEA West Plough Track	S 07 04.4012 W 088 27.8271	4140.1	Landing 3m off profiler, still very turbid	No picture
01/09/2015	18:28:20	DEA West Plough Track	S 07 04.3950 W 088 27.8253	4139.02	Moving a little further to get off the track over which we have been flying several times already	No picture
01/09/2015	18:29:31	DEA West Plough Track	S 07 04.3974 W 088 27.8268	4138	OBSERVATION: fish	No picture
01/09/2015	18:31:41	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Positioning ROV very close to the profiler 2 to deploy chamber 2	No picture

01/09/2015	18:33:04	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Site where chamber 2 is going to be placed	
01/09/2015	18:36:09	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	chamber 2 lowered to seafloor	No picture
01/09/2015	18:38:09	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140	Pressing a bit on the left side to get chamber 2 in a horizontal position	No picture
01/09/2015	18:39:31	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Pentration depth of chamber 2 hard to tell - only a few cm	No picture
01/09/2015	18:41:41	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Chamber 2 positioned at undisturbed site off track	
01/09/2015	18:44:32	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Starting chamber program with magnet	No picture
01/09/2015	18:46:07	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Chamber 2 positioned at deployment site	
01/09/2015	18:46:38	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.2	Chamber 2 positioned at deployment site	
01/09/2015	18:46:54	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.2	Chamber 2 positioned at deployment site	
01/09/2015	18:47:42	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.2	Panorama view profiler 2 and chamber 2 (1 of 3)	
01/09/2015	18:47:50	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.2	Panorama view profiler 2 and chamber 2 (2 of 3)	

01/09/2015	18:48:00	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.2	Panorama view profiler 2 and chamber 2 (3 of 3)	
01/09/2015	18:50:57	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Inserting 11 push cores at the undisturbed site between chamber and profiler	No picture
01/09/2015	18:52:53	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.1	Sediment is quite stiff	No picture
01/09/2015	19:06:48	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	All 11 push cores inserted	
01/09/2015	19:06:59	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	All 11 push cores inserted	
01/09/2015	19:08:08	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Panorama view of push cores between profiler 2 and chamber 2 (1 of 4)	
01/09/2015	19:08:20	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Panorama view of push cores between profiler 2 and chamber 2 (2 of 4)	
01/09/2015	19:08:32	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Panorama view of push cores between profiler 2 and chamber 2 (3 of 4)	
01/09/2015	19:08:43	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Panorama view of push cores between profiler 2 and chamber 2 (4 of 4)	
01/09/2015	19:09:02	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Collecting 11 push cores at the undisturbed site between chamber and profiler	No picture
01/09/2015	19:19:39	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.4	OBSERVATION: Holothurian	No picture

01/09/2015	19:26:59	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.4	Push core sampling site between profiler 2 and chamber 2 after retrieving all cores	
01/09/2015	19:34:07	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4139.9	Repositioning ROV and opening drawer to take two more push cores at the same site	No picture
01/09/2015	19:39:03	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Collecting another 2 push cores at the undisturbed site between chamber 2 and profiler 2	No picture
01/09/2015	19:44:06	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.3	Collecting push core 66	
01/09/2015	19:48:20	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4140.4	OBSERVATION: Parapaguridae (recorded on HD)	No picture
01/09/2015	19:52:55	DEA West Plough Track	S 07 04.4054 W 088 27.8347	4135.5	Flying to profiler 1 to reposition again at valley	No picture
01/09/2015	20:00:08	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4138.22	Landing close to profiler 1	No picture
01/09/2015	20:03:59	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4137.7	Profiler 1 taken off the seafloor	No picture
01/09/2015	20:06:23	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	Site where trial to reposition profiler 1 will take place	
01/09/2015	20:09:22	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	First trial to place profiler 1 on the seafloor fails: to inclined	No picture
01/09/2015	20:10:01	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	Profiler 1 taken off the seafloor to try again at another place	No picture
01/09/2015	20:13:29	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.1	Site where repositioning of profiler #1 will take place	
01/09/2015	20:15:11	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.1	Profiler 1 placed on the seafloor	

01/09/2015	20:21:13	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	Profiler 1 position is again not ideal. Pressing on frame to correct the postion	No picture
01/09/2015	20:22:41	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	Profiler is at its final position in the disturbance track in a valley between between two ripple crests	
01/09/2015	20:22:49	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.2	Profiler is at its final position	
01/09/2015	20:50:15	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.3	Collecting 2 push cores in a valley	No picture
01/09/2015	20:57:16	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.3	Both push cores inserted	
01/09/2015	21:07:45	DEA West Plough Track	S 07 04.4094 W 088 27.8366	4139.4	SAMPLE: SO242-2_D146_NIS1 (ROV Niskin bottle) closed in track near PUC58 and PUC77	No picture
01/09/2015	21:15:20	DEA West Plough Track	S 07 04.4131 W 088 27.8375	4137.3	OBSERVATION: Holothurian	No picture
01/09/2015	21:16:41	DEA West Plough Track	S 07 04.4140 W 088 27.8359	4137.6	OBSERVATION: Parapaguridae	No picture
01/09/2015	21:17:30	DEA West Plough Track	S 07 04.4129 W 088 27.8344	4137.7	OBSERVATION: Parapaguridae	No picture
01/09/2015	21:35:39	DEA West Plough Track	S 07 04.3997 W 088 27.8258	4140.98	OBSERVATION: Ophiuroid	No picture
01/09/2015	21:37:42	DEA West Plough Track	S 07 04.4014 W 088 27.8260	4141.4	Repositioning profiler 2 for next deployment	
01/09/2015	21:39:36	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4141.4	Profiler 2 placed on the seafloor at undisturbed site off track	

01/09/2015	21:41:20	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4141.4	Profiler 2 placed on the seafloor	
01/09/2015	21:45:22	DEA West Plough Track	S 07 04.4000 W 088 27.8274	4141.4	Profiler 2 program started with magnet.	No picture
01/09/2015	22:10:53	DEA West Plough Track	S 07 04.4499 W 088 27.8224	4140.3	Test sediment sampling with Ekman-grab of IRIS / NIOZ	No picture
01/09/2015	22:20:09	DEA West Plough Track	S 07 04.4465 W 088 27.8200	4139.44	OBSERVATION: Ipnops	No picture
01/09/2015	23:03:18	DEA West Plough Track	S 07 04.4461 W 088 27.8272	4138.16	OBSERVATION: Holothurian	No picture
01/09/2015	23:21:07	DEA West Plough Track	S 07 04.4424 W 088 27.8262	4139.2	OBSERVATION: Alcyonacea	No picture
01/09/2015	23:24:09	DEA West Plough Track	S 07 04.4454 W 088 27.8279	4139.1	OBSERVATION: Shrimp	No picture
01/09/2015	23:25:37	DEA West Plough Track	S 07 04.4454 W 088 27.8279	4139.56	Test sediment deposition core / sediment dispenser of Gent University. Did not work.	
01/09/2015	23:25:41	DEA West Plough Track	S 07 04.4454 W 088 27.8279	4139.6	OBSERVATION: Shrimp	No picture
01/09/2015	23:53:01	DEA West Plough Track	S 07 04.4357 W 088 27.8265	4139.14	OBSERVATION: Probeebei	No picture
01/09/2015	23:53:07	DEA West Plough Track	S 07 04.4347 W 088 27.8265	4139.2	OBSERVATION: Ophiuroid	No picture
01/09/2015	23:53:24	DEA West Plough Track	S 07 04.4317 W 088 27.8266	4139.3	OBSERVATION: Stalk	No picture
01/09/2015	23:53:25	DEA West Plough Track	S 07 04.4317 W 088 27.8266	4139.3	OBSERVATION: Stalk	No picture
01/09/2015	23:54:00	DEA West Plough Track	S 07 04.4250 W 088 27.8276	4139.4	OBSERVATION: Unknown	No picture
01/09/2015	23:59:31	DEA West Plough Track	S 07 04.4104 W 088 27.8388	4138.52	Profiler 1 taken off the seafloor for repositioning between ripples in valley	No picture

02/09/2015	00:00:15	DEA West Plough Track	S 07 04.4102 W 088 27.8417	4138.04	Coming across box corer imprint while repositioning profiler 1	
02/09/2015	00:03:51	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4137.3	OBSERVATION: Stalk	No picture
02/09/2015	00:09:28	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.2	Site where repositioning of profiler 1 will take place (?)	
02/09/2015	00:10:25	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	Site where repositioning of profiler 1 will take place (?)	
02/09/2015	00:10:53	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	OBSERVATION: Stalk	No picture
02/09/2015	00:12:21	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	vertical panorama of profiler 1 on sediment (1 of 3)	
02/09/2015	00:12:31	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	vertical panorama of profiler 1 on sediment (2 of 3)	
02/09/2015	00:12:39	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	vertical panorama of profiler 1 on sediment (3 of 3)	
02/09/2015	00:12:40	DEA West Plough Track	S 07 04.4089 W 088 27.8498	4138.1	NO MEASUREMENTS COLLECTED from this deployment of profiler 1. According to hand-written protocol started on 02.09.2015 at 00:17 UTC. Instrument failure.	No picture
02/09/2015	00:20:58	DEA West Plough Track	S 07 04.4178 W 088 27.8455	4134.9	OBSERVATION: Holothurian	No picture
02/09/2015	00:22:58	DEA West Plough Track	S 07 04.4349 W 088 27.8329	4136.88	OBSERVATION: Holothurian	No picture
02/09/2015	00:24:13	DEA West Plough Track	S 07 04.4442 W 088 27.8257	4137.7	OBSERVATION: Stalk	No picture

02/09/2015	00:32:05	DEA West Plough Track	S 07 04.4445 W 088 27.8166	4140.8	OBSERVATION: Shrimp	No picture
02/09/2015	00:32:29	DEA West Plough Track	S 07 04.4445 W 088 27.8166	4140.8	OBSERVATION: Shrimp	No picture
02/09/2015	00:34:40	DEA West Plough Track	S 07 04.4477 W 088 27.8200	4129.6	OFF THE BOTTOM	No picture

created 27/09/2015 22:27:45

Dive summary

Kiel 6000 - Dive: 150-1

SO242/2 (RV Sonne)

Date: **02/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick**
Position: **S 07 04.4149 W 088 27.8522**

Dive duration:

Start: **02/09/2015 13:53:34**
At bottom: **02/09/2015 15:22:52**
Leave bottom: **02/09/2015 23:02:28**
End: **03/09/2015 00:12:37**

Explored sites:

Aims of the Dive:

1. Pushcoring track
2. collecting insitu devices
3. testing of experimental set ups

Required Tools:

1. KIPS
2. Suction pump
3. MAPR
4. 16 pushcores
5. nets and animal collection tool
6. chamber 1 on porch
7. bring back up: Beacon 68, Markers

On Elevator:

1. 2 Chamber
2. 2 Profiler
3. 1 Cube
4. 1 Corral
5. 1 Sediment dispenser
6. 1 Ekman grab

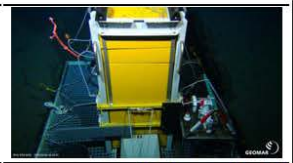
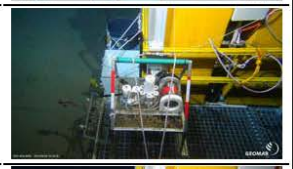
Dive summary:

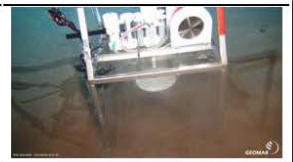
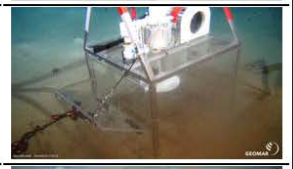
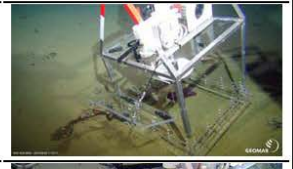
Dive SO242-2_150 (protocol by Tanja Stratmann)
We started this dive at disturbed sites of the western DEA area by placing the chamber 1 on a whitish spot. Cube 3 was placed on two locations within the track to test how deep it would sink into the sediment, before it was placed over a purple holothurian and the test deployment was started. For that purpose the start button was switched on and the program ran for several hours. Meanwhile the profilers 1 and 2 were moved to new locations and 3 pushcores from the ripple top (for meiofauna) and 10 pushcores from the ripple valley were taken. When cube 3 was recovered, the stirrer still stirred and one of the sampling syringes was released. However, unfortunately the tea (test material instead of algae) were not injected, probably as a result of using two septa instead of only one. The sediment inside the area that was previously covered by the cube was sampled with Ekman grab 3 that did not work properly. The last task was to press one of the coralls for the ecotoxicology experiments into the sediment and recover it to see whether the ROV and its pilots could handle it.

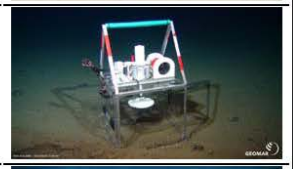
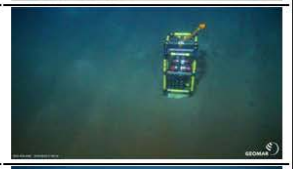
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture

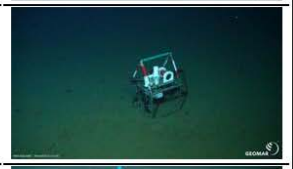
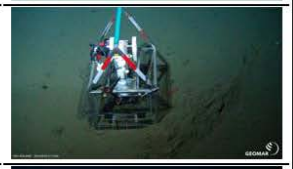
02/09/2015	15:22:52	DEA West Plough Track	S 07 04.4201 W 088 27.8522	4089	AT THE BOTTOM	No picture
02/09/2015	15:24:28	DEA West Plough Track	S 07 04.4206 W 088 27.8538	4096	upper and lower HD on	No picture
02/09/2015	15:49:10	DEA West Plough Track	S 07 04.4106 W 088 27.8140	4101	photo of white spot #1	
02/09/2015	15:49:38	DEA West Plough Track	S 07 04.4106 W 088 27.8140	4101	photo of white spot #1	
02/09/2015	15:58:04	DEA West Plough Track	S 07 04.4106 W 088 27.8140	4101	placement of chamber 1 on whitish spot #1	
02/09/2015	16:08:32	DEA West Plough Track	S 07 04.4117 W 088 27.8045	4101	photo of white spot #2	
02/09/2015	16:09:14	DEA West Plough Track	S 07 04.4117 W 088 27.8045	4101	photo of white spot #2	
02/09/2015	16:13:31	DEA West Plough Track	S 07 04.4117 W 088 27.8045	4101	placement of chamber 1 on whitish spot #2 (chamber 1 penetrates approx. 5 cm into the sediment, 10cm ring visible)	
02/09/2015	16:21:53	DEA West Plough Track	S 07 04.4217 W 088 27.8146	4099	both HD-TV on	No picture
02/09/2015	16:30:41	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4097	flasher + transmitter mounted on elevator 1	No picture

02/09/2015	16:33:52	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4097	photo of elevator 1 at off-track site	
02/09/2015	16:35:38	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4098	photo of cube 3 on elevator 1	
02/09/2015	16:36:55	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4098	photo of cube 3 on elevator 1	
02/09/2015	16:37:01	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4098	photo of cube 3 on elevator 1	
02/09/2015	16:46:15	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4098	photo of track #1	
02/09/2015	16:46:30	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4098	photo of track #1	
02/09/2015	16:49:38	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4100	photo of track #1	
02/09/2015	16:56:38	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4100	photo of cube 3 on track #1 (test how deep cube sinks into sediment)	
02/09/2015	16:56:53	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4100	photo of cube 3 on track #1 (test how deep cube sinks into sediment)	

02/09/2015	16:57:28	DEA West Plough Track	S 07 04.4673 W 088 27.8154	4100	photo of cube 3 on track #1 (test how deep cube sinks into sediment)	
02/09/2015	17:05:23	DEA West Plough Track	S 07 04.4665 W 088 27.8070	4100	photo of cube 3 on track #1 (test how deep cube sinks into sediment)	
02/09/2015	17:05:32	DEA West Plough Track	S 07 04.4665 W 088 27.8070	4100	photo of cube 3 on track #1 (test how deep cube sinks into sediment)	
02/09/2015	17:09:02	DEA West Plough Track	S 07 04.4665 W 088 27.8070	4100	photo of mark that cube 3 left on the seafloor at track #1	
02/09/2015	17:23:59	DEA West Plough Track	S 07 04.4643 W 088 27.8045	4101	photo of cube 3 and white holothurian on seafloor	
02/09/2015	17:24:18	DEA West Plough Track	S 07 04.4643 W 088 27.8045	4101	photo of cube 3 and white holothurian on seafloor	
02/09/2015	17:31:42	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	
02/09/2015	17:32:11	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	
02/09/2015	17:37:22	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	

02/09/2015	17:40:26	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	
02/09/2015	17:43:36	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	
02/09/2015	17:45:16	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4101	photo of cube 3 placed over purple holothurian off track #2	
02/09/2015	17:59:34	DEA West Plough Track	S 07 04.4098 W 088 27.8512	4096	photo of profiler 1	
02/09/2015	18:44:20	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4099	photo of profiler 2	
02/09/2015	18:51:44	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4100	photo of PUC box on ROV porch and PUC	
02/09/2015	18:55:52	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4100	photo of PUC 12, 33, 34 at undisturbed site #1	
02/09/2015	18:56:09	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4100	photo of PUC 12, 33, 34 at undisturbed site #1	
02/09/2015	19:02:28	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4100	photo of profiler 2	

02/09/2015	19:08:30	DEA West Plough Track	S 07 04.4048 W 088 27.8281	4101	photo of ophiuroid	
02/09/2015	19:49:10	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC48 on ripple top #1	
02/09/2015	19:54:29	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC48 on ripple top #1#1	
02/09/2015	19:57:43	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC 14, 48, 55 on ripple top #1	
02/09/2015	20:11:26	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of seafloor	
02/09/2015	20:24:47	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC 13, 18, 23, 24, 46, 53 in ripple valley #1	
02/09/2015	20:36:03	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of seafloor near profiler 2	
02/09/2015	20:45:58	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC 45, 47, 9, 80 in ripple valley #2	
02/09/2015	20:46:07	DEA West Plough Track	S 07 04.4126 W 088 27.8301	4100	photo of PUC 45, 47, 9, 80 in ripple valley #2	
02/09/2015	20:57:54	DEA West Plough Track	S 07 04.4443 W 088 27.8249	4098	water sample with Niskin bottle taken	No picture

02/09/2015	21:02:57	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4099	photo of Ekman grab 3 in IRIS biobox	
02/09/2015	21:11:09	DEA West Plough Track	S 07 04.4599 W 088 27.8085	4100	photo of cube 3 off track #2	
02/09/2015	21:12:16	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4100	photo of cube 3 off track #2	
02/09/2015	21:13:50	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4100	photo of cube 3 off track #2	
02/09/2015	21:16:19	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	photo of cube 3 off track #2	
02/09/2015	21:21:57	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	photo of cube 3 off track #2	
02/09/2015	21:31:19	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	photo of mark that cube 3 left on the seafloor off track #2	
02/09/2015	21:31:57	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	photo of holothurian feaces inside mark that cube 3 left on the seafloor off track #2	
02/09/2015	21:36:57	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	pushing Ekman grab 3into the sediment + release it	No picture
02/09/2015	21:39:18	DEA West Plough Track	S 07 04.4596 W 088 27.8028	4102	holothurian trapped in Ekman grab 3	No picture

02/09/2015	21:48:30	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4098	lost holotuhurian that was trapped in Ekman grab 3	No picture
02/09/2015	21:58:34	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4100	cube 3 secured on elevator 1	No picture
02/09/2015	22:05:23	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4100	Ekman grab 3 secured in biobox + biobox closed	No picture
02/09/2015	22:19:23	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4100	corral secured on elevator 1	No picture
02/09/2015	22:24:46	DEA West Plough Track	S 07 04.4471 W 088 27.8130	4102	pushing corral into sediment	No picture
02/09/2015	22:27:05	DEA West Plough Track	S 07 04.4471 W 088 27.8130	4102	photo of mark that corral left in sediment	
02/09/2015	22:35:47	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4098	release head bouys of elevator 1	No picture
02/09/2015	22:36:39	DEA West Plough Track	S 07 04.4517 W 088 27.8224	4094	rigmaster secures corral on ROV porch	No picture
02/09/2015	22:55:13	DEA West Plough Track	S 07 04.4391 W 088 27.8259	3216	Upper and lower HD off	No picture
02/09/2015	23:02:28	DEA West Plough Track	S 07 04.4374 W 088 27.8288	2921	OFF THE BOTTOM	No picture

created 23/09/2015 23:49:45

Dive summary

Kiel 6000 - Dive: 154-1

SO242/2 (RV Sonne)

Date: **03/09/2015**
Observers: **BOETIUS Antje, HAECKEL Matthias, JANSSEN Felix, LINS Lidia, MEVENKAMP Lisa, PAUL Sophie, PURSER Autun, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.4149 W 088 27.8522**

Dive duration:

Start: **03/09/2015 13:40:28**
At bottom: **03/09/2015 15:12:32**
Leave bottom: **04/09/2015 00:21:21**
End: **04/09/2015 01:49:08**

Explored sites:

Aims of the Dive:

1. Pushcoring track
2. collecting insitu devices
3. testing of experimental set ups

Required Tools:

1. KIPS or 3 Niskin bottles
2. Suction pump
3. MAPR
4. 16 pushcores
5. nets
6. bring back on/in porch: Chamber 1, Markers

On Elevator:

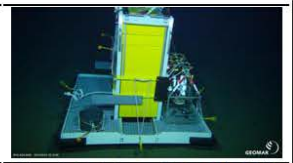
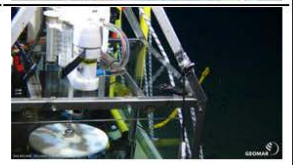
1. Elevator down: 2 Profiler, Cube, box with 6 cores
2. Elevator up: 2 Chambers, 2 Profiler, Beacon

Dive summary:

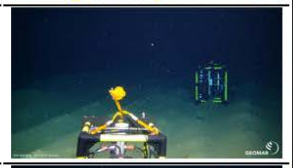
Dive SO242-2_154 (protocol by Lidia Lins)
Placement of profilers 1 and 2 on white spots two times (in the beginning and at the end of the dive, sampling with push corers on white spots, ripples and crests from the ploughed area. Placement of beacon # 68 in the Ekman grab box. Chambers 1, 2 and 3 are put back onto the elevator. The profiler 1 did not turn on correctly the second time, so it was fixed on the elevator while profiler 2 stayed at the seafloor. Furthermore, a plume experiment was conducted and samples were collected with a Niskin bottle.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
03/09/2015	15:12:00	DEA West Plough Track	S 07 04.4396 W 088 27.8217	4096.34	upper HD on	No picture
03/09/2015	15:12:00	DEA West Plough Track	S 07 04.4393 W 088 27.8216	4096.6	AT THE BOTTOM	No picture

03/09/2015	15:15:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.76	photo of elevator 2 (ROV_E_2-1)	
03/09/2015	15:19:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.1	Photo taken of CUBE (BFC) experiment injection syringe	
03/09/2015	15:19:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.12	Photo taken of CUBE (BFC) experiment injection syringe	
03/09/2015	15:22:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099	Photo taken of CUBE (BFC) experiment injection syringe when activated	
03/09/2015	15:34:00	DEA West Plough Track	S 07 04.4202 W 088 27.8190	4098.92	grabbed profiler 1-1 (MICP 1-1) go to Marker 1	No picture
03/09/2015	15:35:00	DEA West Plough Track	S 07 04.4146 W 088 27.8150	4099.3	Lidia and Antje shift	No picture
03/09/2015	15:39:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.7	Found marker 1 , set waypoint, look for white spot to place profiler 1-1 (MICP 1-1)	No picture
03/09/2015	15:40:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.86667	Strong Pl.	No picture
03/09/2015	15:40:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.9	Low nodule area	
03/09/2015	15:40:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.9	Photo from targeted area for profiler 1-1 (MICP 1-1), whitish spots	

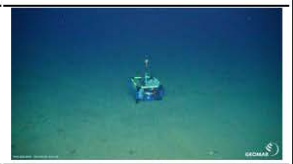
03/09/2015	15:45:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.8	profiler 1-1 (MICP 1-1) placed slightly right of whitish spot, not clear if really in, but very close	
03/09/2015	15:50:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.8	profiler 1-1 (MICP 1-1) start successfully	No picture
03/09/2015	15:53:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.6	now disturbance is cleared, white spot visible under profiler	No picture
03/09/2015	15:56:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.6	place sixpack core box on sediment next to profiler 1-1 (MICP 1-1) at M1	No picture
03/09/2015	16:03:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.7	back at elevator 2 (ROV_E_2-1), will get profiler 2-1 (MICP 2-1)	No picture
03/09/2015	16:09:00	DEA West Plough Track	S 07 04.4299 W 088 27.8249	4097.7	go with elevator 2 (ROV_E_2-1) to Marker 1 and profiler 1-1 (MICP 1-1)	No picture
03/09/2015	16:16:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.1	Whitish spots	
03/09/2015	16:16:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.18333	Whitish spots	
03/09/2015	16:18:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.6	Whitish spots	
03/09/2015	16:25:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.5	Lower HD rec. on	No picture

03/09/2015	16:26:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.5	Profiler 2-1 (MICP 2-1) placed on top of the whittish spots	
03/09/2015	16:26:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.48	waiting to see if the profiler 2-1(MICP 2-1) is placed on top of a Mn nodule	No picture
03/09/2015	16:30:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Lower HD rec. off	No picture
03/09/2015	16:31:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	photo from profiler 2-1 (MICP 2-1)	
03/09/2015	16:31:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Strong Pl.	No picture
03/09/2015	16:31:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Photo Profiler 2-1 (MICP 2-1) and 1-1 (MICP 1-1) together	
03/09/2015	16:31:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Photo Profiler 2-1 (MICP 2-1) and 1-1 (MICP 1-1) together	
03/09/2015	16:32:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Panorama photo of profilers 2-1 (MICP 2-1) and 1-1 (MICP 1-1)	
03/09/2015	16:32:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Panorama photo of profilers 2-1 (MICP 2-1) and 1-1 (MICP 1-1)	
03/09/2015	16:32:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Panorama photo of profilers 2-1 (MICP 2-1) and 1-1 (MICP 1-1)	

03/09/2015	16:33:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Panorama photo of profilers 2-1 (MICP 2-1) and 1-1 (MICP 1-1)	
03/09/2015	16:33:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.4	Close-up from Profiler 2-1 (MICP 2-1)	
03/09/2015	16:41:00	DEA West Plough Track	S 07 04.4117 W 088 27.8260	4099.4	Lower HD rec. on	No picture
03/09/2015	16:41:00	DEA West Plough Track	S 07 04.4116 W 088 27.8264	4099.3	white-patch landscape	No picture
03/09/2015	16:43:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	Lower HD rec. off	No picture
03/09/2015	16:46:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 71, on white spot	No picture
03/09/2015	16:47:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 83, om top of the white spot	No picture
03/09/2015	16:49:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 62, on top of white spot	No picture
03/09/2015	16:52:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 57, on top of the whitish spot	No picture
03/09/2015	16:54:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 82, on top of the whitish spot	No picture
03/09/2015	16:55:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.8	PUC 59, on top of the white spots	No picture
03/09/2015	16:57:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 49, on top of the whitish spot	No picture
03/09/2015	16:59:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 76, on top of the whitish spots	No picture

03/09/2015	17:00:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	Photo taken of push corers on whitish spots	
03/09/2015	17:01:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	Photo taken of push corers on whitish spots	
03/09/2015	17:07:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 62 put back in the ROV	No picture
03/09/2015	17:07:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 57 put back in the ROV	No picture
03/09/2015	17:08:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 71 put back in the ROV	No picture
03/09/2015	17:09:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 59 put back in the ROV	No picture
03/09/2015	17:11:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.71667	PUC 63 put back in the ROV	No picture
03/09/2015	17:13:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 76 put back in the ROV	No picture
03/09/2015	17:14:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 49 put back in the ROV	No picture
03/09/2015	17:16:00	DEA West Plough Track	S 07 04.4103 W 088 27.8262	4099.7	PUC 82 put back in the ROV	No picture
03/09/2015	17:21:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	moved few meters to look for other white spots	No picture
03/09/2015	17:21:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	photo from the white spots	
03/09/2015	17:22:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	photo from the white spots	

03/09/2015	17:25:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	PUC 77 placed on white spot	No picture
03/09/2015	17:26:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	PUC 73 placed on white spot	No picture
03/09/2015	17:28:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	PUC 58 placed on white spot	No picture
03/09/2015	17:30:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	PUC 50 on white spot	No picture
03/09/2015	17:32:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	PUC 79 placed on white spot	No picture
03/09/2015	17:32:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	Photo of push corers on white spots	
03/09/2015	17:33:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	PUC 50 put back in the ROV	No picture
03/09/2015	17:34:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.6	PUC 79 put back in the ROV	No picture
03/09/2015	17:36:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	PUC 77 put back in the ROV	No picture
03/09/2015	17:37:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	PUC 73 put back in the ROV	No picture
03/09/2015	17:38:00	DEA West Plough Track	S 07 04.4096 W 088 27.8269	4099.7	PUC 58 put back in the ROV	No picture
03/09/2015	17:41:00	DEA West Plough Track	S 07 04.4087 W 088 27.8277	4097.6	Move to chamber 3-1 (ISCHAM 3-1, beacon #68)	No picture
03/09/2015	17:52:00	DEA West Plough Track	S 07 04.4091 W 088 27.8323	4098.7	Taking chamber 3-1 (ISCHAM 3-1)	No picture
03/09/2015	17:53:00	DEA West Plough Track	S 07 04.4091 W 088 27.8323	4098.1	move to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	17:57:00	DEA West Plough	S 07 04.4318 W 088	4096.9	arrived at elevator 2-1 (ROV_E_2-1)	No picture

		Track	27.8286			
03/09/2015	18:02:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.8	chamber 3-1 (ISCHAM 3-1) put on elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	18:06:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098	chamber 3-1 (ISCHAM 3-1) tightened to elevator (ROV_E_2-1)	No picture
03/09/2015	18:08:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.9	move to beacon 68 to find corer box	No picture
03/09/2015	18:30:00	DEA West Plough Track	S 07 04.4077 W 088 27.8300	4098	sediment plume impedes sight, corer box will be retrieved later	No picture
03/09/2015	18:30:00	DEA West Plough Track	S 07 04.4075 W 088 27.8300	4098	move to chamber 2-1 (ISCHAM 2-1)	No picture
03/09/2015	18:31:00	DEA West Plough Track	S 07 04.4051 W 088 27.8293	4098.1	Photo of chamber 2-1 (ISCHAM 2-1)	
03/09/2015	18:37:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.6	Photo undisturbed next to chamber 2-1 (ISCHAM 2-1)	
03/09/2015	18:37:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.6	Photo undisturbed next to chamber 2-1 (ISCHAM 2-1)	
03/09/2015	18:38:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.6	No plough	No picture
03/09/2015	18:40:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.42727	Photo from PUC 74 being placed	
03/09/2015	18:41:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.4	Photo from PUC 74 being retrieved	

03/09/2015	18:43:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.3	take chamber 2-1 (ISCHAM 2-1)	No picture
03/09/2015	18:44:00	DEA West Plough Track	S 07 04.4009 W 088 27.8295	4099.17143	move to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	18:54:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4096.1	arrival at elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	18:58:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.6	chamber 2-1 (ISCHAM 2-1) placed on elevator	No picture
03/09/2015	19:06:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.72	tightened chamber 2-1 (ISCHAM 2-1) to elevator	No picture
03/09/2015	19:11:00	DEA West Plough Track	S 07 04.4189 W 088 27.8211	4097.9	go to profiler 2-2 (MICP 2-2) (it will be restarted on the same spot)	No picture
03/09/2015	19:18:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.7	profiler 2-2 (MICP 2-2) switched on	No picture
03/09/2015	19:21:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.9	now moved to profiler 1-2 (MICP 2-2)	No picture
03/09/2015	19:23:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.7	profiler 1-2 (MICP 1-2) could not be switched on	No picture
03/09/2015	19:30:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.7	Strong Pl.	
03/09/2015	19:31:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.6	PUC 56 placed on whitish spot	
03/09/2015	19:32:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.58	PUC 56 taken	No picture
03/09/2015	19:36:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.3	corer box (six pack) taken	No picture
03/09/2015	19:36:00	DEA West Plough	S 07 04.4118 W 088	4099.84	move to beacon #68	No picture

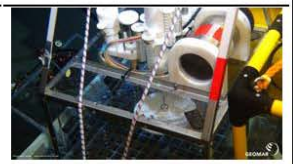
		Track	27.8172			
03/09/2015	19:45:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	sit down to collect pushcores from disturbed track, on crest	No picture
03/09/2015	19:45:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	Strong Pl.	No picture
03/09/2015	19:45:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	wait for cloud to go away	No picture
03/09/2015	19:49:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	photo of ripples for push core sampling	
03/09/2015	19:55:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	pushcoring next to Box corer imprint	No picture
03/09/2015	19:59:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	valley and crest not really clear. taking the two cores and moving again	
03/09/2015	20:00:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	PUC 38 placed on valley	No picture
03/09/2015	20:03:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	PUC 20 placed on ripple crest	No picture
03/09/2015	20:03:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4098.3	moving ROV to clearer ripple / trough situation	No picture
03/09/2015	20:06:00	DEA West Plough Track	S 07 04.4126 W 088 27.8384	4097.9	crew shift. Fritz at manipulator	No picture
03/09/2015	20:07:00	DEA West Plough Track	S 07 04.4105 W 088 27.8397	4097.72	following clearly visible tracks westward	No picture
03/09/2015	20:08:00	DEA West Plough Track	S 07 04.4093 W 088 27.8407	4097.9	another box corer imprint visible in the distance.	No picture
03/09/2015	20:08:00	DEA West Plough Track	S 07 04.4094 W 088 27.8417	4098.2	ROV landing	No picture

03/09/2015	20:10:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 25 into sediment, valley	No picture
03/09/2015	20:12:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	last core shifted a little to the left upon sampling	No picture
03/09/2015	20:12:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 32 into sediment, ripple valley	No picture
03/09/2015	20:14:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 31 into sediment, valley	No picture
03/09/2015	20:16:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 35 - another core at CREST because crest was not very clearly discernible at previous site	No picture
03/09/2015	20:16:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Photo taken of sampled pushcorers	
03/09/2015	20:16:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	push core shifted a bit to the left upon sampling	No picture
03/09/2015	20:17:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Photo taken of sampled pushcorers	
03/09/2015	20:17:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Photo taken of sampled pushcorers	
03/09/2015	20:17:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Photo taken of sampled pushcorers	
03/09/2015	20:18:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Pushcore retrieved	No picture

03/09/2015	20:18:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 35 placed on crest	No picture
03/09/2015	20:19:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Pushcore retrieved	No picture
03/09/2015	20:19:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 31 placed on valley	No picture
03/09/2015	20:20:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	relatively short core	No picture
03/09/2015	20:21:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Pushcore retrieved	No picture
03/09/2015	20:22:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 32 placed on valley, relatively short core	No picture
03/09/2015	20:23:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	Pushcore retrieved	No picture
03/09/2015	20:23:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	PUC 25 placed on valley	No picture
03/09/2015	20:23:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4098.2	all cores collected	No picture
03/09/2015	20:26:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4097.5	putting sixpack back on porch	No picture
03/09/2015	20:26:00	DEA West Plough Track	S 07 04.4111 W 088 27.8400	4097.36	moving towards the east to collect beacon #68	No picture
03/09/2015	20:27:00	DEA West Plough Track	S 07 04.4108 W 088 27.8373	4097.42	beacon in view	No picture
03/09/2015	20:30:00	DEA West Plough Track	S 07 04.4128 W 088 27.8317	4098.72	removing beacon #68 from the sediment	No picture
03/09/2015	20:30:00	DEA West Plough Track	S 07 04.4128 W 088 27.8317	4098.48333	Beacon retrieved	No picture
03/09/2015	20:31:00	DEA West Plough Track	S 07 04.4128 W 088 27.8317	4098.1	ROV flying to Elevator	No picture

03/09/2015	20:33:00	DEA West Plough Track	S 07 04.4318 W 088 27.8281	4097.2	elevator in view	No picture
03/09/2015	20:37:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.1	beacon #68 placed in Ekman grab box	No picture
03/09/2015	20:41:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.2	ekman grab box lid closed as far as possible - problematic as cable tie that holds lid open is too strong	No picture
03/09/2015	20:47:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.04	problems securing rubber cord of ekman grab box lid	No picture
03/09/2015	20:49:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.1	giving up to close lid for now	No picture
03/09/2015	20:52:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.1	moving sixpack from porch to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	20:54:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.1	sixpack positioned at elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	20:56:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.1	another try to close the lid of the ekman grab box with the beacon- this time successful	No picture
03/09/2015	21:03:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.72	flying towards profiler 1-2 (MICP 1-2) (the one where the second profile could not be started)	No picture
03/09/2015	21:04:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4100.3	hovering in front of profiler 1-2 (MICP 1-2)	No picture
03/09/2015	21:08:00	DEA West Plough Track	S 07 04.4118 W 088 27.8172	4099.36	profiler 1-2 (MICP 1-2) removed from whitish spot - positioned on the porch. still no light	No picture

					on (program does not seem to be active)	
03/09/2015	21:08:00	DEA West Plough Track	S 07 04.4157 W 088 27.8184	4099.16	flying back to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	21:10:00	DEA West Plough Track	S 07 04.4335 W 088 27.8236	4097.1	elevator 2-1 (ROV_E_2-1) comes into view	No picture
03/09/2015	21:14:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.74	very poor visibility. slowly moving towards elevator with profiler 1-2 (MICP 1-2) on the porch	No picture
03/09/2015	21:24:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.4	moving the profiler 1-2 (MICP 1-2) a bit to the right to get it into the right postion for fixing with the rubber cord	No picture
03/09/2015	21:28:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4099.4	fixing profiler 1-2 (MICP 1-2) position with the rubber strap	No picture
03/09/2015	21:31:00	DEA West Plough Track	S 07 04.4316 W 088 27.8257	4097.1	heading from elevator 2-1 (ROV_E_2-1) towards marker	No picture
03/09/2015	21:37:00	DEA West Plough Track	S 07 04.4119 W 088 27.8457	4097	searching for marker #1 on the track	No picture
03/09/2015	21:38:00	DEA West Plough Track	S 07 04.4117 W 088 27.8450	4097	box corer imprint	No picture
03/09/2015	21:38:00	DEA West Plough Track	S 07 04.4120 W 088 27.8421	4097.38571	another box corer impring	No picture
03/09/2015	21:41:00	DEA West Plough Track	S 07 04.4141 W 088 27.8267	4099.4	cannot find marker at the moment. heading for profiler 2-2 (MICP 2-2)	No picture
03/09/2015	21:45:00	DEA West Plough Track	S 07 04.4124 W 088 27.8117	4100.7	marker 1 set as waypoint in dive 154 file	No picture

03/09/2015	21:45:00	DEA West Plough Track	S 07 04.4123 W 088 27.8117	4100.7	marker collected in port drawer	No picture
03/09/2015	21:55:00	DEA West Plough Track	S 07 04.4088 W 088 27.7970	4101.4	Marker 2 collected and in porch	No picture
03/09/2015	21:58:00	DEA West Plough Track	S 07 04.4088 W 088 27.7970	4101.5	sponge on nodule collected, next to Marker 2 (between tracks)	
03/09/2015	22:05:00	DEA West Plough Track	S 07 04.4088 W 088 27.7970	4102	nodule crumbled, sponge collected without nodule (seems to have root beneath nodule)	No picture
03/09/2015	22:05:00	DEA West Plough Track	S 07 04.4088 W 088 27.7970	4102	Photo taken of ROV arm	
03/09/2015	22:08:00	DEA West Plough Track	S 07 04.4076 W 088 27.8049	4100	now go to profiler 1-2 (MICP 1-2) to pick up for elevator	No picture
03/09/2015	22:16:00	DEA West Plough Track	S 07 04.4134 W 088 27.8197	4100.1	pick up profiler 1-2 (MICP 1-2)	No picture
03/09/2015	22:22:00	DEA West Plough Track	S 07 04.4194 W 088 27.8223	4098.9	go to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	22:23:00	DEA West Plough Track	S 07 04.4258 W 088 27.8236	4098.5	put profiler 1-2 (MICP 1-2) onto elevator	No picture
03/09/2015	22:29:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.8	put profiler 1-2 (MICP 1-2) onto elevator	No picture
03/09/2015	22:32:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.8	Photo taken of running CUBE (BFC) experiment	

03/09/2015	22:34:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.8	Photo taken of running CUBE (BFC) experiment	
03/09/2015	22:54:00	DEA West Plough Track	S 07 04.4341 W 088 27.8227	4097.86	fly back to track	No picture
03/09/2015	22:58:00	DEA West Plough Track	S 07 04.4280 W 088 27.8256	4099.68	collect sponge next to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	22:58:00	DEA West Plough Track	S 07 04.4280 W 088 27.8256	4099.7	Photo taken of sponge next to elevator 2-1 (ROV_E_2-1)	
03/09/2015	22:58:00	DEA West Plough Track	S 07 04.4280 W 088 27.8256	4099.8	Photo taken of sponge next to elevator 2-1 (ROV_E_2-1)	
03/09/2015	23:02:00	DEA West Plough Track	S 07 04.4281 W 088 27.8289	4100.1	sponge sampling missed target	No picture
03/09/2015	23:06:00	DEA West Plough Track	S 07 04.4264 W 088 27.8268	4100.1	Photo taken of ophiuroid	
03/09/2015	23:06:00	DEA West Plough Track	S 07 04.4264 W 088 27.8268	4100.1	Photo taken of ophiuroid	
03/09/2015	23:06:00	DEA West Plough Track	S 07 04.4264 W 088 27.8268	4100.1	Ophiuroid 1 collected	
03/09/2015	23:18:00	DEA West Plough Track	S 07 04.4257 W 088 27.8280	4100.2	hydroid or young crinoid sitting on nodule collected	No picture
03/09/2015	23:20:00	DEA West Plough Track	S 07 04.4239 W 088 27.8275	4100.2	sampling failed of hydroid, nodule crumpled again	No picture

03/09/2015	23:27:00	DEA West Plough Track	S 07 04.4152 W 088 27.8259	4098	plume experiment in track	No picture
03/09/2015	23:27:00	DEA West Plough Track	S 07 04.4152 W 088 27.8259	4098	start of experiment: no turbidity	No picture
03/09/2015	23:30:00	DEA West Plough Track	S 07 04.4152 W 088 27.8259	4098.8	ROV creates plume	
03/09/2015	23:31:00	DEA West Plough Track	S 07 04.4152 W 088 27.8259	4099	sample left Niskin 1-1 (NIS 1-1)	No picture
03/09/2015	23:34:00	DEA West Plough Track	S 07 04.4152 W 088 27.8259	4099.2	take middle Niskin 2-1 (NIS 2-1)	No picture
03/09/2015	23:39:00	DEA West Plough Track	S 07 04.4255 W 088 27.8208	4099.6	taken right Niskin 3-1 (NIS 3-1)	No picture
03/09/2015	23:40:00	DEA West Plough Track	S 07 04.4239 W 088 27.8217	4094.96	fly in and out of plume	No picture
03/09/2015	23:40:00	DEA West Plough Track	S 07 04.4233 W 088 27.8221	4093.6	flying up with ROV	No picture
03/09/2015	23:41:00	DEA West Plough Track	S 07 04.4204 W 088 27.8233	4087.8	plume slowly getting less in 10 m height above ground	No picture
03/09/2015	23:41:00	DEA West Plough Track	S 07 04.4183 W 088 27.8240	4085.16	plume height 15 m	No picture
03/09/2015	23:43:00	DEA West Plough Track	S 07 04.4151 W 088 27.8253	4086.14	clearing dirt from porch	No picture
03/09/2015	23:43:00	DEA West Plough Track	S 07 04.4152 W 088 27.8255	4088.1	flying down into plume again	No picture
03/09/2015	23:46:00	DEA West Plough Track	S 07 04.4159 W 088 27.8238	4098.2	Photo taken of plume experiment	

03/09/2015	23:47:00	DEA West Plough Track	S 07 04.4153 W 088 27.8226	4098.3	Photo taken of plume experiment	
03/09/2015	23:47:00	DEA West Plough Track	S 07 04.4143 W 088 27.8209	4098.5	Photo taken of plume experiment	
03/09/2015	23:47:00	DEA West Plough Track	S 07 04.4139 W 088 27.8201	4098.64	height of plume of photo: 2.6 m	
03/09/2015	23:48:00	DEA West Plough Track	S 07 04.4134 W 088 27.8190	4098.8	Photo taken after plume experiment	
03/09/2015	23:50:00	DEA West Plough Track	S 07 04.4140 W 088 27.8086	4099.98333	chamber 1-1 (ISCHAM 1-1) pick up	No picture
03/09/2015	23:50:00	DEA West Plough Track	S 07 04.4140 W 088 27.8086	4099.88	fly to elevator 2-1 (ROV_E_2-1)	No picture
03/09/2015	23:52:00	DEA West Plough Track	S 07 04.4187 W 088 27.8148	4098.9	fly into upper part of created plume	No picture
03/09/2015	23:54:00	DEA West Plough Track	S 07 04.4316 W 088 27.8221	4098.3	plume extended south to elevator 2-1 (ROV_E_2-1)	
03/09/2015	23:56:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4097.8	chamber 1-1 (ISCHAM 1-1) put onto porch	No picture
04/09/2015	00:00:00	DEA West Plough Track	S 07 04.4373 W 088 27.8244	4098.2	head buoy of elevator 2-1 (ROV_E_2-1) released	No picture
04/09/2015	00:03:00	DEA West Plough Track	S 07 04.4357 W 088 27.8241	4098.7	six pack PCs picked up	No picture
04/09/2015	00:03:00	DEA West Plough Track	S 07 04.4359 W 088 27.8246	4098.7	six pack on porch	No picture

04/09/2015	00:08:00	DEA West Plough Track	S 07 04.4372 W 088 27.8271	4085.46	OFF THE BOTTOM	No picture
04/09/2015	00:21:00	DEA West Plough Track	S 07 04.4175 W 088 27.8261	3703.1	upper HD off	No picture

created 23/09/2015 23:59:54

Dive summary

Kiel 6000 - Dive: 163-1

SO242/2 (RV Sonne)

Date: **05/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, MEVENKAMP Lisa, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick**
Position: **S 07 04.5172 W 088 26.9229**

Dive duration:

Start: **05/09/2015 13:31:18**
At bottom: **05/09/2015 15:10:01**
Leave bottom: **05/09/2015 21:56:10**
End: **05/09/2015 23:38:16**

Explored sites:

Aims of the Dive:

1. Deploy inCUBEator chambers for food web studies

Required Tools:

1. pushcores
2. Alastairs samplers (instead of biobox)
3. suction pump
4. benthic chamber on porch

On Elevator:

1. Elevator 2 down: 3 CUBEs, 4 respirometers, beacon 68
2. Elevator 2 up (4 days later): 3 CUBEs, 4 respirometers, beacon 68

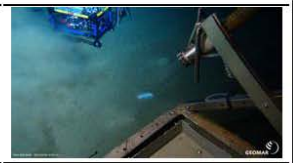
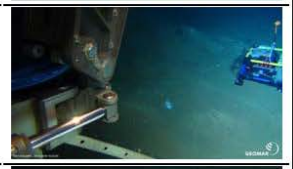
Dive summary:

Dive SO242-2_163 (protocol by Dick Van Oevelen)
Dive 163 was used to deploy MPI chamber 3 (with beacon 68), take a set of 16 pushcores from a ripple in the plough track, initiate a 4-day BICs incubation with holothurians, slurp holothurians for tissue analysis, collect nodules for the sediment dispenser experiment and test the sediment shakers for the ecotoxicology experiments. Originally, the plan was to start a 4-day CUBE incubation, but the program of two CUBEs (2+3) were unintentionally started during the elevator descent. Decided to leave CUBE1 on the elevator and bring CUBE2+3 up on the porch for redeployment the next dive.

Dive report:

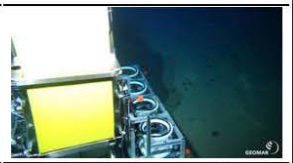
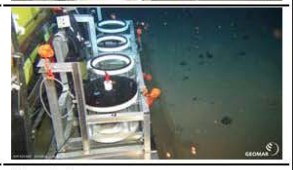
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
05/09/2015	15:10:01	DEA East Plough Track	S 07 04.4630 W 088 27.0167	4085.55455	AT THE BOTTOM	No picture
05/09/2015	15:12:36	DEA East Plough Track	S 07 04.4546 W 088 27.0420	4096.9	Upper HD on	No picture
05/09/2015	15:23:51	DEA East Plough Track	S 07 04.4674 W 088 27.0189	4096.58	Grabbed beacon 68 underway to chamber position	No picture

05/09/2015	15:30:54	DEA East Plough Track	S 07 04.4900 W 088 26.9406	4100.32727	Problem is that 2 cubes have already started	No picture
05/09/2015	15:36:06	DEA East Plough Track	S 07 04.4826 W 088 26.9216	4101.8	Plough tracks spotted, they are heavily sedimented	No picture
05/09/2015	15:44:36	DEA East Plough Track	S 07 04.4878 W 088 26.9280	4102.2	Many white patches on track, chose track with some ripples	No picture
05/09/2015	15:48:34	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.21818	Beacon 68 placed on ripple stream	No picture
05/09/2015	15:51:44	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	place chamber 3 on disturbance area in track (sedimented ripple)	No picture
05/09/2015	15:53:26	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Lower HD rec. on	No picture
05/09/2015	15:54:10	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo of position for chamber 3 with holothurian and beacon	
05/09/2015	15:54:31	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo of position for chamber 3 with holothurian and beacon	
05/09/2015	15:56:09	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Chamber 3 placed. check for penetration depth	No picture
05/09/2015	15:58:24	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Lower HD rec. off	No picture
05/09/2015	15:59:20	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.7	Photo: Chamber 3 after placement	
05/09/2015	15:59:31	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.67	Photo: Chamber 3 after placement	

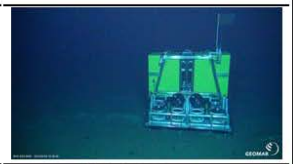
05/09/2015	16:01:14	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.14545	Photo: Beautiful white seacucumber	
05/09/2015	16:01:50	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103	Photo: Chamber 3 with beacon	
05/09/2015	16:02:05	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4102.9	Photo: Chamber 3 with beautiful white seacucumber	
05/09/2015	16:02:30	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4102.9	Photo: Beautiful white seacucumber	
05/09/2015	16:02:56	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4102.68182	Photo: Beautiful white seacucumber	
05/09/2015	16:07:36	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo: Landscape of pushcoring 163 - ripples disturbed track	
05/09/2015	16:07:54	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Lower HD rec. on	No picture
05/09/2015	16:08:08	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo: Landscape of pushcoring 163 - ripples disturbed track	
05/09/2015	16:08:15	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo: Landscape of pushcoring 163 - ripples disturbed track	
05/09/2015	16:08:24	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	Photo: Landscape of pushcoring 163 - ripples disturbed track	

05/09/2015	16:12:12	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	No nodules	No picture
05/09/2015	16:12:14	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	start pushcoring PC24	No picture
05/09/2015	16:13:56	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc35	No picture
05/09/2015	16:14:01	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc13	No picture
05/09/2015	16:14:46	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc20	No picture
05/09/2015	16:16:08	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc18	No picture
05/09/2015	16:17:32	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc48	No picture
05/09/2015	16:19:12	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4104	pc38	No picture
05/09/2015	16:20:36	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc53	No picture
05/09/2015	16:20:51	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	Lower HD rec. off	No picture
05/09/2015	16:23:08	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc 79	No picture
05/09/2015	16:23:25	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	Underground seems hard, rov moves when pushing in the cores	No picture
05/09/2015	16:23:52	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc55	No picture
05/09/2015	16:25:01	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc9	No picture
05/09/2015	16:26:03	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc33	No picture

05/09/2015	16:27:08	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc33	No picture
05/09/2015	16:27:12	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc74	No picture
05/09/2015	16:28:44	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc46	No picture
05/09/2015	16:29:49	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	pc80	No picture
05/09/2015	16:30:11	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	Photo: Pushcores 163 on ripples disturbed track	
05/09/2015	16:30:18	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	Photo: Pushcores 163 on ripples disturbed track	
05/09/2015	16:32:22	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	Clear layering of cores, ca 6-7 cm brown on top and stiff white layer below	No picture
05/09/2015	16:34:51	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.9	lost one core, repeat pc53	No picture
05/09/2015	16:54:50	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.8	finished pushcoring	No picture
05/09/2015	16:55:25	DEA East Plough Track	S 07 04.4925 W 088 26.9338	4103.61	Photo: Red jelly 'attacks'	
05/09/2015	17:01:36	DEA East Plough Track	S 07 04.4758 W 088 27.0043	4098.77692	Pro Sci: Dick, Obs; Andrew	No picture
05/09/2015	17:02:30	DEA East Plough Track	S 07 04.4716 W 088 27.0147	4098.44286	Flying to elevator 2	No picture

05/09/2015	17:09:27	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.83889	Photo: BICs on elevator2	
05/09/2015	17:10:43	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.07647	Photo: BICs on elevator2	
05/09/2015	17:11:49	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.37059	Order of BICs on elevator: 4 left, 3 middle left, 1 middle right, 2 far right	No picture
05/09/2015	17:12:11	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.4	Closing respirometer 4 for background incubation (has thin layer of sediment in it)	No picture
05/09/2015	17:18:05	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.5	respirometer 4 closed	No picture
05/09/2015	17:18:16	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.5	Photo: BICs on elevator2, with BIC4 closed	
05/09/2015	17:18:25	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.5	Photo: BICs on elevator2, with BIC4 closed	
05/09/2015	17:19:44	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.5	Confirmation that all stirrers of BICs are turning	No picture
05/09/2015	17:26:08	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.4	Flying northward away from the track	No picture
05/09/2015	17:26:29	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.33	flying north for holo hunting	No picture
05/09/2015	17:30:06	DEA East Plough Track	S 07 04.4473 W 088 27.0530	4098.4	close up confirms that we probably have a scotoplanes	No picture

05/09/2015	17:30:09	DEA East Plough Track	S 07 04.4473 W 088 27.0530	4098.4	Photo: Holothurian Scotoplanes for BIC incubation	
05/09/2015	17:30:19	DEA East Plough Track	S 07 04.4473 W 088 27.0530	4098.4	Photo: Holothurian Scotoplanes for BIC incubation	
05/09/2015	17:30:33	DEA East Plough Track	S 07 04.4473 W 088 27.0530	4098.49	Photo: Holothurian Scotoplanes for BIC incubation	
05/09/2015	17:33:46	DEA East Plough Track	S 07 04.4473 W 088 27.0530	4097.87273	Scotoplanes in slurp gun	No picture
05/09/2015	17:36:11	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4096.34	Photo: Slurp gun and BICs in background	
05/09/2015	17:39:26	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.02	Released Scotoplanes in BIC2	No picture
05/09/2015	17:39:34	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098	Closed lid of BIC2	No picture
05/09/2015	17:48:28	DEA East Plough Track	S 07 04.4516 W 088 27.0723	4098.85	New holothurian spotted: Amperima, take to BICs	No picture
05/09/2015	17:51:26	DEA East Plough Track	S 07 04.4516 W 088 27.0723	4094.98	Too dusty, decided to move to new position northward to get better view	No picture
05/09/2015	18:09:37	DEA East Plough Track	S 07 04.4372 W 088 27.0521	4097.5	New holothurian spotted: Scotoplanes	No picture
05/09/2015	18:10:00	DEA East Plough Track	S 07 04.4372 W 088 27.0521	4097.5	Photo: Scotoplanes	

05/09/2015	18:12:32	DEA East Plough Track	S 07 04.4372 W 088 27.0521	4097.6	Scotoplanes slurped, but probably damaged, will be brought up in slurp gun chamber	No picture
05/09/2015	18:18:48	DEA East Plough Track	S 07 04.4328 W 088 27.0522	4097.3	Photo: Mesothuria spotted	
05/09/2015	18:22:45	DEA East Plough Track	S 07 04.4326 W 088 27.0509	4097.05	Mesothuria in slurp gun, return to elevator	No picture
05/09/2015	18:26:06	DEA East Plough Track	S 07 04.4458 W 088 27.0545	4096.69091	Photo: BICs on elevator2	
05/09/2015	18:26:34	DEA East Plough Track	S 07 04.4474 W 088 27.0545	4096.86	Photo: Mesothuria in tube of slurp gun	
05/09/2015	18:29:22	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098	Mesothuria in BIC1	No picture
05/09/2015	18:33:03	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.3	Lower HD rec. on	No picture
05/09/2015	18:34:59	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.84545	Lower HD rec. off	No picture
05/09/2015	18:35:46	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.4	Photo: BIC1 and BIC 2 closed	
05/09/2015	18:44:24	DEA East Plough Track	S 07 04.4441 W 088 27.0499	4097.85	Photo: New Scotoplanes specimen with slurp gun	
05/09/2015	18:44:53	DEA East Plough Track	S 07 04.4441 W 088 27.0499	4097.87273	Photo: New Scotoplanes specimen with slurp gun	

05/09/2015	18:45:46	DEA East Plough Track	S 07 04.4441 W 088 27.0499	4097.45	Slurped up Scotoplanes carefully, return to respirometer	No picture
05/09/2015	18:50:22	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.59	Lower HD rec. on	No picture
05/09/2015	18:56:46	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.1	Scotoplanes in BIC3 and lid of chamber secured	No picture
05/09/2015	18:59:49	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.2	Lower HD rec. off	No picture
05/09/2015	19:00:11	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.2	pan taken with lower HD camera for overview	No picture
05/09/2015	19:01:59	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.3	Photo: Three BICs on elevator2	
05/09/2015	19:14:17	DEA East Plough Track	S 07 04.4306 W 088 27.0480	4097.2	Photo: Scotoplanes specimen	
05/09/2015	19:25:25	DEA East Plough Track	S 07 04.4273 W 088 27.0419	4097.2	Photo: Scotoplanes specimen	
05/09/2015	19:26:03	DEA East Plough Track	S 07 04.4280 W 088 27.0412	4097.2	Scotoplanes broke and is stored inchambers 2+3	No picture
05/09/2015	19:26:13	DEA East Plough Track	S 07 04.4281 W 088 27.0411	4097.2	New Scotoplanes slurped	No picture
05/09/2015	19:27:17	DEA East Plough Track	S 07 04.4271 W 088 27.0403	4097	Scotoplanes in chamber 4	No picture
05/09/2015	19:32:33	DEA East Plough Track	S 07 04.4228 W 088 27.0373	4097	Chamber moves to no. 5, part of Scotoplanes is now in chamber 4+5	No picture

05/09/2015	19:33:33	DEA East Plough Track	S 07 04.4223 W 088 27.0371	4097.1	Photo: New holothurian spotted, blurred picture	
05/09/2015	19:33:41	DEA East Plough Track	S 07 04.4223 W 088 27.0372	4097.1	Photo: New holothurian spotted	
05/09/2015	19:35:54	DEA East Plough Track	S 07 04.4229 W 088 27.0382	4097	Holothurian (probably) slurped into chamber 5	No picture
05/09/2015	19:38:20	DEA East Plough Track	S 07 04.4228 W 088 27.0373	4097.1	Photo: Unknown holothurian, possibly Paleopatides spp.	
05/09/2015	19:40:08	DEA East Plough Track	S 07 04.4236 W 088 27.0374	4097.1	Specimen too large for slurp gun, attempt to catch with net and store it in a box	No picture
05/09/2015	19:43:39	DEA East Plough Track	S 07 04.4235 W 088 27.0373	4096.5	Catch successful	No picture
05/09/2015	19:54:06	DEA East Plough Track	S 07 04.4209 W 088 27.0280	4096.6	Holothurian spotted, probably Synelactus (pink)	No picture
05/09/2015	19:54:27	DEA East Plough Track	S 07 04.4209 W 088 27.0280	4096.6	Scynelactus slurped into chamber 6	No picture
05/09/2015	19:55:06	DEA East Plough Track	S 07 04.4209 W 088 27.0280	4096.7	Photo: Synelactus close up	
05/09/2015	20:02:23	DEA East Plough Track	S 07 04.4208 W 088 27.0272	4096.94	Photo: Sponge with ophiuroid, blurred picture	
05/09/2015	20:12:42	DEA East Plough Track	S 07 04.4459 W 088 27.0556	4097.7	Photo: Enteropneust, dark and blurred	

05/09/2015	20:13:10	DEA East Plough Track	S 07 04.4472 W 088 27.0565	4097.8	Photo: Enteropneust	
05/09/2015	20:18:01	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.4	Photo: Curious octopus, too dark	
05/09/2015	20:18:39	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.5	Photo: Curious octopus	
05/09/2015	20:19:16	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.5	Photo: Curious octopus	
05/09/2015	20:19:29	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.6	Photo: Curious octopus	
05/09/2015	20:19:56	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.6	Photo: Curious octopus	
05/09/2015	20:20:59	DEA East Plough Track	S 07 04.4596 W 088 27.0694	4098.7	Photo: Curious octopus	
05/09/2015	20:29:26	DEA East Plough Track	S 07 04.4667 W 088 27.0841	4099.15455	White plastic litter found	No picture
05/09/2015	20:29:32	DEA East Plough Track	S 07 04.4667 W 088 27.0841	4099.1	Plastic litter taken by ROV	No picture
05/09/2015	20:31:36	DEA East Plough Track	S 07 04.4667 W 088 27.0841	4098.6	Plastic/paper is in a pushcore box, unsure whether secured	No picture
05/09/2015	20:33:11	DEA East Plough Track	S 07 04.4623 W 088 27.0807	4098.7	Holothurian Deima spp. spotted	No picture

05/09/2015	20:34:31	DEA East Plough Track	S 07 04.4623 W 088 27.0807	4099	Photo: Holothurian Deima spp.	
05/09/2015	20:38:03	DEA East Plough Track	S 07 04.4623 W 088 27.0807	4099.7	Deima slurped	No picture
05/09/2015	20:39:55	DEA East Plough Track	S 07 04.4623 W 088 27.0807	4099.2	Deima is stuck in slurpgun	No picture
05/09/2015	20:46:01	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4098	Scooping nodules with the net for sediment dispenser experiment	No picture
05/09/2015	20:58:17	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099	Three nodules scooped	No picture
05/09/2015	21:00:13	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099	Test to pick up nodule with the manipulator arm	No picture
05/09/2015	21:01:52	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099.1	Photo: Approaching nodule with manipulator arm	
05/09/2015	21:03:37	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099.1	Nodule picked up and stored in drawer	No picture
05/09/2015	21:10:44	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099	Photo: Emptying bottle with artificial sediment	
05/09/2015	21:11:00	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099	Photo: Emptying bottle with artificial sediment	
05/09/2015	21:13:06	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099	Sediment bottle 1 emptied successfully	No picture
05/09/2015	21:16:02	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4099.1	Sediment bottle 2 emptied successfully	No picture

05/09/2015	21:20:10	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4098.8	Photo: Sediment shaker result	
05/09/2015	21:20:23	DEA East Plough Track	S 07 04.4567 W 088 27.0602	4098.76	Photo: Sediment shaker result	
05/09/2015	21:24:22	DEA East Plough Track	S 07 04.4551 W 088 27.0524	4095.02727	Lower HD rec. off	No picture
05/09/2015	21:25:04	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4095.43	arrived at elevator	No picture
05/09/2015	21:36:21	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.9	CUBE 2 (program was unitentionally started during elevator descent) taken from elevator	No picture
05/09/2015	21:37:34	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.9	CUBE 2 on porch	No picture
05/09/2015	21:40:25	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.9	Algal injector of CUBE 1 is okay	No picture
05/09/2015	21:44:10	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4098.1	CUBE 3 (program was unitentionally started during elevator descent) taken from elevator	No picture
05/09/2015	21:48:24	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097.09	CUBE 3 on porch	No picture
05/09/2015	21:49:11	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4097	CUBE2 and CUBE3: stirrers were active and algae were already 'injected'	No picture
05/09/2015	21:55:41	DEA East Plough Track	S 07 04.4512 W 088 27.0517	4091.82	CUBEs secured for the way up	No picture

05/09/2015	21:56:10	DEA East Plough Track	S 07 04.4532 W 088 27.0499	4085.8	OFF THE BOTTOM	No picture
05/09/2015	21:56:35	DEA East Plough Track	S 07 04.4529 W 088 27.0496	4078.8	upper HD off	No picture

created 27/09/2015 23:12:51

Dive summary

Kiel 6000 - Dive: 166-1

SO242/2 (RV Sonne)

Date: **06/09/2015**
Observers: **BOETIUS Antje, BOHSUNG Seinab, HAECKEL Matthias, JANSSEN Felix, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 04.467 W 088 27.041**

Dive duration:

Start: **06/09/2015 13:25:48**
At bottom: **06/09/2015 14:59:40**
Leave bottom: **06/09/2015 23:31:04**
End: **07/09/2015 01:08:37**

Explored sites:

Aims of the Dive:

1. Deploy inCUBEator chambers for food web studies
2. push coring
3. in situ chambers
4. profilers

Required Tools:

1. 16 pushcores (1 predrilled – red)
2. suction pump
3. BioBox
4. Magnet T-Stick
5. 1 CUBE down on porch

On Elevator:

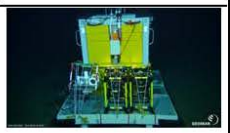
1. Elevator 2 (beacon 67): 1 CUBE, 4 respirometers (done)
2. Elevator 1 (beacon 66): profiler 1 and 2, chamber 1 and 2, 1 CUBE
3. Elevator 2 up (10.09.2015): 3 CUBEs, 4 respirometers, beacon 68
4. Elevator 1 up (07.09.2015): profiler 1 and 2, chamber 1 and 2

Dive summary:

Dive SO242-2_166 (protocol by Seinab Bohsung)
This dive was carried out in the disturbed area DEA East. The aim of the dive was to deploy the inCUBEators for food web studies, to take push cores and deploy chambers and profilers. 14 push cores were taken in undisturbed area including one predrilled core (labeled red). Two extra push cores were taken from a ripple valley. Beacon 68, which was supposed to mark the position for pushcoring, failed as it did not send out any signal and thus could not be found. Instead we orientated ourselves with the help of other waypoints. Profiler 1 was placed on the seafloor, its lamp started blinking, but the motor did not start turning. The deployment of Profiler 2 on the other hand was successful as its motor started turning. However, Profiler 2 could not be replaced for a second measruement, since its sensors were broken after the first profiling. Various animals were sighted during the dive; amongst others we saw a big fish, a crab, a sponge, many holothurians, a mesothuria and an Ophiuroid.

Dive report:

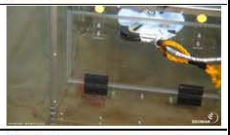
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
06/09/2015	14:59:40	DEA East Plough Track	S 07 04.4741 W 088 27.0461	4098.58	AT THE BOTTOM	No picture
06/09/2015	15:10:30	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4099.3	Photo of holothurian which is going to be used for experiment with CUBE 3 (BFC)	
06/09/2015	15:10:34	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4099.3	Photo of holothurian which is going to be used for experiment with CUBE 3 (BFC)	
06/09/2015	15:15:41	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100	way point added named ROV-166 CUBE3 in track	No picture

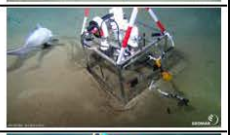
06/09/2015	15:19:55	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100.4	Photo of CUBE 3 (BFC). Infront of CUBE 3 (BFC) there is a salp and an Ophiuroid	
06/09/2015	15:20:07	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100.4	Photo of holothurian which is trapped inside CUBE 3 (SO242-2_D166_BFC-CUBE#3-holothurian). Salp infront of CUBE 3 (BFC)	
06/09/2015	15:20:49	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100.4	Close up photo of holothurian inside CUBE 3 (BFC).Close up photo of holothurian inside CUBE 3 (BFC).Close up photo of holothurian inside CUBE 3 (BFC).Close up photo of holothurian inside CUBE 3 (BFC).Close up photo of holothurian inside CUBE 3 (BFC).	
06/09/2015	15:22:46	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100.4	Photo of experimental set up. CUBE 3 (BFC) with holothurian inside	
06/09/2015	15:24:23	DEA East Plough Track	S 07 04.4714 W 088 27.0468	4100.4	program in CUBE 3 (SO242-2_D166_BFC-CUBE#3) started	No picture
06/09/2015	15:36:48	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4098.9	Photo of elevator 1 (ROV_E) with Profiler 1 (MICP), Profiler 2 (MICP) and cube (BFC)Photo of elevator 1 (ROV_E) with Profiler 1 (MICP), Profiler 2 (MICP) and cube (BFC)Photo of elevator 1 (ROV_E) with Profiler 1 (MICP), Profiler 2 (MICP) and cube (BFC)Photo of elevator 1 (ROV_E) with Profiler 1 (MICP), Profiler 2 (MICP) and cube (BFC)Photo of elevator 1 (ROV_E) with Profiler 1 (MICP), Profiler 2 (MICP) and cube (BFC)	
06/09/2015	15:52:37	DEA East Plough Track	S 07 04.4759 W 088 26.9460	4100.9	Photo of holoturian. Photo was taken while on the way to beacon 68 with Profiler 1 (MICP)	
06/09/2015	15:52:42	DEA East Plough Track	S 07 04.4760 W 088 26.9461	4100.9	Photo of holoturian. Photo was taken while on the way to beacon 68 with Profiler 1 (MICP)	
06/09/2015	15:52:45	DEA East Plough Track	S 07 04.4761 W 088 26.9462	4100.9	Photo of holoturian. Photo was taken while on the way to beacon 68 with Profiler 1 (MICP)	
06/09/2015	16:01:14	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo of spot where profiler 1 (MICP) is going to be placed. Holothurian in upper left corner of the picture	
06/09/2015	16:01:32	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo of spot where profiler 1 (MICP) is going to be placed	

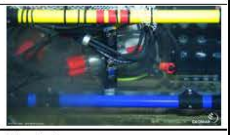
06/09/2015	16:03:56	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo of profiler 1 (MICP) placed on seafloor	
06/09/2015	16:04:03	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo of profiler 1 (MICP)placed on seafloor	
06/09/2015	16:04:23	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	photo of sensors	
06/09/2015	16:10:14	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	lamp of profiler 1 (SO242-2_D166_MICP-Profiler1) started blinking but motor does not turn	No picture
06/09/2015	16:33:32	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo taken of spot where profiler 2 (MICP) is going to be placed	
06/09/2015	16:33:57	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo taken of spot where profiler 2 (MICP) is going to be placed	
06/09/2015	16:34:07	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Photo taken of spot where profiler 2 (MICP) is going to be placed	
06/09/2015	16:37:41	DEA East Plough Track	S 07 04.4912 W 088 26.9376	4103.1	Profiler 2 (SO242-2_D166_MICP-Profiler2) is placed on seafloor at disturbed area and its motor started to turn	No picture
06/09/2015	16:45:26	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4099.1	Photo of Elevator (ROV_E) with postcard for Uni Kiel	
06/09/2015	16:45:34	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4099.18	Photo of Elevator (ROV_E) with postcard for Uni Kiel	
06/09/2015	16:45:49	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4099.2	Photo Elevator (ROV_E) with Chamber 1 (BFC) and Chamber 2 (BFC)	
06/09/2015	16:57:01	DEA East Plough Track	S 07 04.4627 W 088 26.9308	4101.3	Photo of undisturbed patch South of elevator (ROV_E) where Chamber 1 (BFC) is going to be placed (other place than originally planned)	
06/09/2015	16:57:08	DEA East Plough Track	S 07 04.4627 W 088 26.9308	4101.3	Close up photo of place for Chamber 1 (BFC), patch without nodules was selected for chamber 1 (BFC) deployment	

06/09/2015	17:00:18	DEA East Plough Track	S 07 04.4627 W 088 26.9308	4101.5	Photo of Chamber 1 (SO242-2_D166_BFC-Chamber1) placed on seafloor	
06/09/2015	17:01:07	DEA East Plough Track	S 07 04.4627 W 088 26.9308	4101.6	Close up photo of Chamber 1 (BFC) to check for penetration depth. Three yellow rings are visible (third ring is entirely visible).	
06/09/2015	17:07:16	DEA East Plough Track	S 07 04.4627 W 088 26.9308	4097.44	chamber LED flashing as expected. program seems to be running OK. Chamber 1 (BFC) is positioned in reference area off track	No picture
06/09/2015	17:13:32	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4098.57778	Photo of Elevator (ROV_E) with postcard for Uni Kiel	
06/09/2015	17:14:38	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4099.425	Photo of Elevator (ROV_E) with postcard for Uni Kiel	
06/09/2015	17:14:55	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4099.5	Photo of Elevator (ROV_E) with postcard for Uni Kiel	
06/09/2015	17:19:38	DEA East Plough Track	S 07 04.4425 W 088 26.9430	4098.1	flying towards disturbance track / beacon #68	No picture
06/09/2015	17:23:44	DEA East Plough Track	S 07 04.4780 W 088 26.9507	4099.8	beacon #68 not working	No picture
06/09/2015	17:41:41	DEA East Plough Track	S 07 04.4898 W 088 26.9286	4103.9	Photo of flat sediment ripple where chamber 2 (BFC) is going to be placed. Close to gC imprint	
06/09/2015	17:44:28	DEA East Plough Track	S 07 04.4898 W 088 26.9286	4103.9	Photo of chamber 2 (SO242-2_D166_BFC-Chamber2) on seafloor. penetration between second and third yellow ring (counted from the top)	
06/09/2015	17:58:04	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.76	Photo of area where push cores (PUC) will be taken	
06/09/2015	17:58:16	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.9	Photo of area where push cores (PUC) will be taken	
06/09/2015	17:58:24	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.9	Photo of area where push cores (PUC) will be taken	

06/09/2015	17:58:34	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.9	Photo of area where push cores (PUC) will be taken	
06/09/2015	17:58:57	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.9	Photo of area where push cores (PUC) will be taken	
06/09/2015	18:01:42	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.9	sonar screen shot is taken and is named "SO242_PC_166"	No picture
06/09/2015	18:21:22	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.8	Photo of push cores (PUC) in sediment (SO242-2_D166_PUC 68,28,50,59,73,58,70,75,72,66,77,56,64,62). PUC 70 an 77 are slightly tilted. PUC 28 is marked because it will be used for pore water extraction with rhizonesPhoto of push cores (PUC) in sediment (SO242-2_D166_PUC 68,28,50,59,73,58,70,75,72,66,77,56,64,62). PUC 70 an 77 are slightly tilted. PUC 28 is marked because it will be used for pore water extraction with rhizonesPhoto of push cores (PUC) in sediment (SO242-2_D166_PUC 68,28,50,59,73,58,70,75,72,66,77,56,64,62). PUC 70 an 77 are slightly tilted. PUC 28 is marked because it will be used for pore water extraction with rhizonesPhoto of push cores (PUC) in sediment (SO242-2_D166_PUC 68,28,50,59,73,58,70,75,72,66,77,56,64,62). PUC 70 an 77 are slightly tilted. PUC 28 is marked because it will be used for pore water extraction with rhizones	
06/09/2015	18:21:35	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.8	Photo of all PUCs in sediment. PUC 62 hit hard patch, potentially a nodlue underground. Even the ROV was moving when placing PC 62	
06/09/2015	18:27:38	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.8	PUC 73 is fragmented/broken in upper layer	No picture
06/09/2015	18:31:00	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.8	PUC 62 contains a very dark brown patch at bottom of core. its the same core that went into sediment not so easily	No picture
06/09/2015	18:38:44	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.8	PUC 50 disturbed while putting back into drawer	No picture
06/09/2015	18:40:27	DEA East Plough Track	S 07 04.4585 W 088 26.9241	4101.7	Photo of place where all PUCs have been sampled and then were retrieved. (PUC 68,28,50,59,73,58,70,75,72,66,77,56,64,62)	
06/09/2015	19:14:34	DEA East Plough Track	S 07 04.4774 W 088 26.9176	4103	Photo of ripple valley where push cores (PUC) will be taken	
06/09/2015	19:14:44	DEA East Plough Track	S 07 04.4774 W 088 26.9176	4103.08333	Photo of ripple valley where push cores (PUC) will be taken	

06/09/2015	19:19:40	DEA East Plough Track	S 07 04.4774 W 088 26.9176	4103	Photo of SO242-2_D166_PUC69 and SO242-2_D166_PUC63 in sediment	
06/09/2015	19:25:02	DEA East Plough Track	S 07 04.4774 W 088 26.9176	4102.54	Photo of area where PUC 69 and PUC 63 have been sampled and were retrieved afterwards	
06/09/2015	19:25:02	DEA East Plough Track	S 07 04.4774 W 088 26.9176	4102.54	placing a marker "ripple valley 166"	No picture
06/09/2015	21:16:18	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4100.9	Photo of holothurian	
06/09/2015	21:16:29	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4100.9	Photo of holothurian	
06/09/2015	21:25:21	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4102	Photo of holothurian inside cube 2 (SO242-2_D166_BFC-CUBE#2-holothurian). holothurian is swimming	
06/09/2015	21:25:36	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4102	Photo of holothurian inside cube 2 (BFC). holothurian is swimming	
06/09/2015	21:26:08	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4102	Photo of holothuiran inside cube 2 (BFC), lower part of cube.	
06/09/2015	21:26:17	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4102	Photo of holothuiran inside cube 2 (BFC), lower part of cube.	
06/09/2015	21:27:20	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4101.2	photo of lower beasel taken	
06/09/2015	21:32:23	DEA East Plough Track	S 07 04.4761 W 088 26.9325	4101.48333	start button of cube 2 (SO242-2_D166_BFC-CUBE#2) was triggered. Experiment started	No picture
06/09/2015	21:57:25	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4097.4	photo of Scotoplanes	
06/09/2015	21:58:29	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4097.86	photo of Scotoplanes	

06/09/2015	22:05:39	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.8	photos of cube 1 (SO242-2_D166_BFC-CUBE#1-scotoplanes) with Scotoplanes	
06/09/2015	22:05:55	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.7	photos of cube 1 (BFC) with Scotoplanes	
06/09/2015	22:08:21	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	photo of beasel taken	
06/09/2015	22:09:39	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	Photo of cube 1 (BFC) with scotoplanes inside, and fish outside	
06/09/2015	22:09:44	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	Photo of cube 1 (BFC) with scotoplanes inside, and fish outside	
06/09/2015	22:09:51	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	Photo of cube 1 (BFC) with scotoplanes inside, and fish outside	
06/09/2015	22:11:30	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	Photo of fish	
06/09/2015	22:11:36	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.6	Photo of fish	
06/09/2015	22:11:48	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.56667	Photo of fish	
06/09/2015	22:12:04	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.5	Photo of fish	
06/09/2015	22:12:46	DEA East Plough Track	S 07 04.4613 W 088 27.0538	4098.06667	Photo of fish and cube 1 (BFC)	
06/09/2015	22:26:10	DEA East Plough Track	S 07 04.4940 W 088 26.9405	4102.2	go to profiler 2 (MICP), replace to undisturbed area at chamber 1 (BFC)	No picture

06/09/2015	22:28:27	DEA East Plough Track	S 07 04.4911 W 088 26.9381	4100.96667	Photo of profiler 2 (SO242-2_D166_MICP-Profiler2-2). close-up of sensors.	
06/09/2015	22:36:45	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4101.3	Photo of holothurian between chamber 3 (BFC) and profiler 2 (MICP)	
06/09/2015	22:36:58	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4101.3	Photo of holothurian between chamber 3 (BFC) and profiler 2 (MICP)	
06/09/2015	22:45:55	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.6	Photo of holothurian at chamber 3 (BFC)	
06/09/2015	22:47:17	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.7	close-up photo of holothurian	
06/09/2015	22:47:36	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.7	close-up photo of holothurian	
06/09/2015	22:50:07	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.4	Photo of holothurian at chamber 3 (BFC)	
06/09/2015	22:50:21	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.3	Photo of holothurian at chamber 3 (BFC)	
06/09/2015	22:50:27	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.3	chamber (SO242-2_D166_BFC-chamber#3) replaced by 0.5 meters (not taken up as initially planned). start with only optodes	No picture
06/09/2015	22:52:24	DEA East Plough Track	S 07 04.4926 W 088 26.9359	4102.7	Photo of chamber 3 (BFC), penetration depth: three rings of chamber 3 (BFC) are visible (10 cm overlying water?)	
06/09/2015	23:31:04	DEA East Plough Track	S 07 04.4487 W 088 26.9849	4084.96	OFF THE BOTTOM	No picture

created 27/09/2015 23:21:52

Dive summary

Kiel 6000 - Dive: 169-1

SO242/2 (RV Sonne)

Date: **07/09/2015**
Observers: **BOETIUS Antje, HAECKEL Matthias, HAECKEL Matthias, JANSSEN Felix, LEMBURG Johannes, NORNES Stein, PAUL Sophie, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.4952 W 088 26.9417**

Dive duration:

Start: **07/09/2015 12:47:28**
At bottom: **07/09/2015 15:21:38**
Leave bottom: **08/09/2015 00:30:32**
End: **08/09/2015 02:13:25**

Explored sites:

Aims of the Dive:

1. push coring
2. in situ chambers
3. profilers
4. Niskin bottle experiment (with CTD)

Required Tools:

1. 16 pushcores
2. suction pump
3. BioBox
4. Magnet T-Stick
5. 2 profiler down on porch
6. 3 Niskin bottles + CTD attached

On Elevator:

1. Elevator 2 (beacon 67): 4 respirometers (done)
2. Elevator 1 (beacon 66): None
3. Elevator 2 up (10.09.2015): 3 CUBEs, 4 respirometers, beacon 68
4. Elevator 1 up (07.09.2015): profiler 1 and 2, chamber 1 and 2

Dive summary:

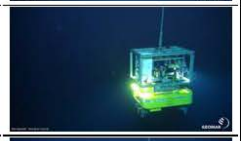
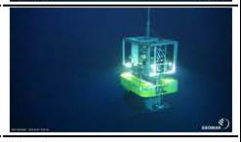
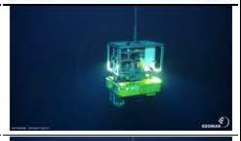
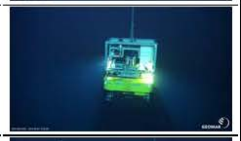
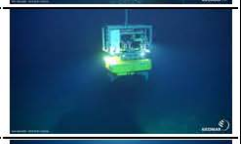
Dive SO242-2_169 (protocol by Matthias Haeckel)
This was the third dive exploring the disturbed area of the DEA East. Profiler 1 and Profiler 2 were carried down with ROV. We started with placing Profiler 1 in an undisturbed area ~20 m off the old plough tracks (next to Chamber 1) and placing Profiler 2 in the ploughed track above a ripple crest (next to Chamber 2). Both Profilers were repositioned within their microhabitat once during the dive. We collected 14 push cores from the ripple valley microhabitat and 2 push cores from a white patch in the old plough tracks. During the dive we observed the deployment of the Crawler, which was lowered from the ship via cable and released by the Launcher. Unfortunately, the Crawler did not start moving – we checked back on the Crawler 2 hours later after some push coring and relocating of the Profilers. Towards the end of the dive we conducted a sediment plume experiment by whirling up sediment with the ROV and drifting in the sediment cloud for about 1 h. 3 Niskin bottles were fired at different times to sample the sediment particles and water in the plume. Here, the aim is to investigate if (toxic) metals are released from the sediment and oxygen consumption is increased in consequence. The creation of sediment plumes is expected to be one of the major results of future deep-sea mining, but its impacts are unknown. Finally, both Profilers and all three Chambers were picked up and fixed onto Elevator 1 for recovery. Chamber 3 and Beacon 68 were brought up by the ROV.

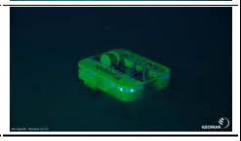
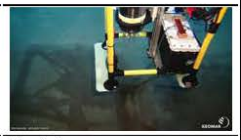
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
07/09/2015	15:21:38	DEA East Plough Track	S 07 04.4705 W 088 26.9162	4100	AT THE BOTTOM	No picture
07/09/2015	15:30:16	DEA East Plough Track	S 07 04.4623 W 088 26.9181	4099.2	Dive 169 starts	No picture
07/09/2015	15:41:27	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4101.9	photo of undisturbed area for Profiler 1 deployment	

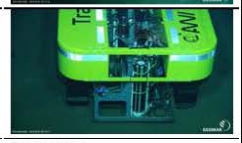
07/09/2015	15:41:49	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4101.9	another photo of undisturbed area for Profiler 1 deployment	
07/09/2015	15:46:29	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4101.9	photo of deployment of Profiler 1 in undisturbed area	
07/09/2015	15:48:03	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4101.9	Close-up photo of sensors of Profiler 1	
07/09/2015	15:48:28	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4101.9	another close-up photo of position of sensors of Profiler 1 with respect to seafloor	
07/09/2015	15:51:23	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4102	Profiler 1 started with Magnetic stick: SO242-2_D169_MICP1-1	No picture
07/09/2015	15:59:02	DEA East Plough Track	S 07 04.4940 W 088 26.9345	4101.18	Chamber 2 spotted and searching for deployment location in track for Profiler 2	No picture
07/09/2015	16:08:15	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.16667	Photo of shrimp sitting in track	
07/09/2015	16:11:34	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Lower HD rec. on to film deployment of Profiler 2	No picture
07/09/2015	16:14:25	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Photo of track location of Profiler 2 deployment	
07/09/2015	16:19:39	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Close-up photo of sensors of Profiler 2 above ripple crest	
07/09/2015	16:19:53	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Lower HD rec. off	No picture
07/09/2015	16:19:57	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Photo of Profiler 2 deployed in track above ripple crest	
07/09/2015	16:22:05	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4103.6	Profiler 2 started with Magnetic stick: SO242-2_D169_MICP2-1	No picture
07/09/2015	16:24:41	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4102.56	flying to find a position for push coring in plough mark	No picture

07/09/2015	16:38:38	DEA East Plough Track	S 07 04.4791 W 088 26.9146	4103.8	push coring in ripple valley of plough mark for geochemistry and microbiology	No picture
07/09/2015	17:14:33	DEA East Plough Track	S 07 04.4791 W 088 26.9146	4103.7	Photo of 13 PUCs in ripple valley: SO242-2_D169_PUCxx (x = 9,13,18,20,24,33,34,38,49,55,57,67,79)	
07/09/2015	17:14:58	DEA East Plough Track	S 07 04.4791 W 088 26.9146	4103.72727	Close-up photo of PUCs on right side	
07/09/2015	17:15:16	DEA East Plough Track	S 07 04.4791 W 088 26.9146	4103.8	Close-up photo of PUCs on left side	
07/09/2015	17:35:02	DEA East Plough Track	S 07 04.4791 W 088 26.9146	4102.92	Photo of PUC spots after PUCs have been pulled out	
07/09/2015	17:37:43	DEA East Plough Track	S 07 04.4877 W 088 26.9231	4101.11875	fly to meet with Crawler and film its deployment via Launcher	No picture
07/09/2015	17:40:28	DEA East Plough Track	S 07 04.4945 W 088 26.9305	4099.95	positioning ROV for Crawler touch-down: ROV at 13 m above ground & 50 m safety distance	No picture
07/09/2015	17:51:11	DEA East Plough Track	S 07 04.4967 W 088 26.9298	4082.53571	Lower HD rec. on to film approaching Crawler and ist deployment	No picture
07/09/2015	17:55:36	DEA East Plough Track	S 07 04.5149 W 088 26.9205	4084.10714	Photo of approaching Crawler (SO242-2_170-1_BCRAWL) from distance	
07/09/2015	17:58:19	DEA East Plough Track	S 07 04.5193 W 088 26.9181	4088.68571	Photo of Crawler lowered with Launcher from ship	
07/09/2015	17:58:34	DEA East Plough Track	S 07 04.5198 W 088 26.9180	4089.4	Photo of Crawler lowered with Launcher from ship	
07/09/2015	17:58:45	DEA East Plough Track	S 07 04.5202 W 088 26.9178	4089.95	Photo of Crawler lowered to 5 m above seafloor	
07/09/2015	18:00:54	DEA East Plough Track	S 07 04.5221 W 088 26.9148	4096.61429	Photo of Crawler lowered towards seafloor	

07/09/2015	18:01:13	DEA East Plough Track	S 07 04.5224 W 088 26.9143	4097.74	Photo of Crawler lowered towards seafloor	
07/09/2015	18:01:28	DEA East Plough Track	S 07 04.5225 W 088 26.9140	4098.5	Photo of Crawler lowered towards seafloor	
07/09/2015	18:01:49	DEA East Plough Track	S 07 04.5227 W 088 26.9133	4099.25	Photo of Crawler lowered towards seafloor	
07/09/2015	18:01:56	DEA East Plough Track	S 07 04.5230 W 088 26.9131	4099.5	Camera of Launcher is off -> cannot film the ROV	No picture
07/09/2015	18:02:00	DEA East Plough Track	S 07 04.5230 W 088 26.9130	4099.58571	Photo of Crawler lowered towards seafloor	
07/09/2015	18:02:13	DEA East Plough Track	S 07 04.5232 W 088 26.9126	4099.88571	Photo of Crawler lowered towards seafloor	
07/09/2015	18:02:20	DEA East Plough Track	S 07 04.5234 W 088 26.9125	4100.08571	Photo of Crawler lowered towards seafloor	
07/09/2015	18:03:03	DEA East Plough Track	S 07 04.5241 W 088 26.9113	4100.94286	Photo of Crawler turning above seafloor	
07/09/2015	18:05:09	DEA East Plough Track	S 07 04.5246 W 088 26.9107	4102.62857	Photo of Crawler before release by Launcher	
07/09/2015	18:05:42	DEA East Plough Track	S 07 04.5247 W 088 26.9105	4102.8	Photo of Crawler touching down on seafloor and creating large sediment cloud	
07/09/2015	18:05:50	DEA East Plough Track	S 07 04.5247 W 088 26.9104	4102.85714	Photo of Crawler touching down on seafloor and creating large sediment cloud	
07/09/2015	18:06:52	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4102.9	Close-up photo of Crawler at seafloor (SO242-2_170-1_BCRAWL)	

07/09/2015	18:16:33	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4103.5	Photo of Crawler in clearly visible plough marks (Launcher is lighting up area)	
07/09/2015	18:17:27	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4103.5	Photo of Crawler, which is not starting to move -> decision to revisit later	
07/09/2015	18:26:44	DEA East Plough Track	S 07 04.5067 W 088 26.9239	4097.2	fly to Profiler 1 for repositioning	No picture
07/09/2015	18:28:35	DEA East Plough Track	S 07 04.4958 W 088 26.9231	4097.70667	Lower HD rec. off	No picture
07/09/2015	18:36:36	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4100.45333	Photo of Profiler 1 (SO242-1_D169_MICP1-1)	
07/09/2015	18:45:46	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4100.9	Photo of grabbing and lifting up of Profiler 1	
07/09/2015	18:45:55	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4100.9	Photo of grabbing and lifting up of Profiler 1	
07/09/2015	18:48:24	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4100.9	Close-up photo of re-positioned Profiler 1	
07/09/2015	18:51:51	DEA East Plough Track	S 07 04.4563 W 088 26.9176	4100.7	Profiler 1 started successfully: SO242-1_D169_MICP1-2	No picture
07/09/2015	18:59:02	DEA East Plough Track	S 07 04.4787 W 088 26.9205	4102.2	repositioning of Profiler 2	No picture
07/09/2015	19:05:37	DEA East Plough Track	S 07 04.4820 W 088 26.9102	4102.5	Photo of new spot (a few meters east of 1st location) for Profiler 2	
07/09/2015	19:09:13	DEA East Plough Track	S 07 04.4820 W 088 26.9102	4102.6	Profiler 2 is placed on ripple crest, but sinks in too deep, so it needs to be repositioned again	No picture
07/09/2015	19:17:20	DEA East Plough Track	S 07 04.4820 W 088 26.9102	4102.6	Profiler 2 place in new position and started: SO242-2_D169_MICP2-2	No picture
07/09/2015	19:25:16	DEA East Plough Track	S 07 04.4932 W 088 26.9340	4101.8	flying along track to find white patch in plough mark for push coring for geochemistry	No picture

07/09/2015	19:36:17	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4102.9875	Close-up photo of white patch	
07/09/2015	19:36:39	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.13125	Photo of white patch with nearby box corer mark	
07/09/2015	19:37:25	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.32667	Photo of Profiler 2 at some distance	
07/09/2015	19:37:52	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.4	Photo of nearby box corer mark and distant Profiler 2	
07/09/2015	19:48:00	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.4	Photo of push cores for geochemistry taken in white patch: SO242-2_D169_PUCxx (x = 10,83)	
07/09/2015	19:51:15	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.4	Photo of ophiuroid next to PUCs (sampling of ophiuroid failed)	
07/09/2015	19:57:51	DEA East Plough Track	S 07 04.4803 W 088 26.9140	4103.4	fish swimming by	No picture
07/09/2015	20:06:58	DEA East Plough Track	S 07 04.4830 W 088 26.9146	4102.54667	fly to revisit Crawler	No picture
07/09/2015	20:11:39	DEA East Plough Track	S 07 04.5129 W 088 26.9189	4102.72857	Photo of blue holothurian with tail	
07/09/2015	20:11:56	DEA East Plough Track	S 07 04.5139 W 088 26.9185	4102.85	Photo of blue holothurian with tail	
07/09/2015	20:12:55	DEA East Plough Track	S 07 04.5168 W 088 26.9164	4103.17143	Photo of blue holothurian with tail	
07/09/2015	20:13:07	DEA East Plough Track	S 07 04.5171 W 088 26.9161	4103.2	Photo of white spiky holothurian	

07/09/2015	20:14:47	DEA East Plough Track	S 07 04.5194 W 088 26.9129	4103.5	Photo of Crawler, which has not moved in the meantime (no trail visible)	
07/09/2015	20:16:55	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4104	Photo of Crawler from side	
07/09/2015	20:17:19	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4104.1	Photo of Crawler from front	
07/09/2015	20:18:17	DEA East Plough Track	S 07 04.5240 W 088 26.9100	4104.2	Close-up photo of microprofilers of Crawler	
07/09/2015	20:22:26	DEA East Plough Track	S 07 04.5231 W 088 26.9128	4103.5	leave Crawler to conduct plume experiment	No picture
07/09/2015	20:32:00	DEA East Plough Track	S 07 04.4857 W 088 26.9579	4099	Photo of fish	
07/09/2015	20:38:08	DEA East Plough Track	S 07 04.4884 W 088 26.9593	4100.27368	start of plume experiment by touching down with ROV twice in plough mark, then drifting with current 1 m above seafloor	No picture
07/09/2015	20:40:02	DEA East Plough Track	S 07 04.4868 W 088 26.9637	4101.02941	Photo of created sediment plume	
07/09/2015	20:40:23	DEA East Plough Track	S 07 04.4869 W 088 26.9637	4101.15294	Photo of created sediment plume	
07/09/2015	20:41:37	DEA East Plough Track	S 07 04.4869 W 088 26.9632	4101.4	ROV drifting southward with current	No picture
07/09/2015	20:41:49	DEA East Plough Track	S 07 04.4869 W 088 26.9631	4101.4	ROV drifting out of the sediment plume	No picture
07/09/2015	20:42:58	DEA East Plough Track	S 07 04.4890 W 088 26.9645	4101.575	Photo of drifting sediment plume	
07/09/2015	20:43:07	DEA East Plough Track	S 07 04.4892 W 088 26.9646	4101.6	Photo of drifting sediment plume	

07/09/2015	20:44:34	DEA East Plough Track	S 07 04.4908 W 088 26.9653	4101.7	ROV flying back into sediment plume and down to 0.5 m above seafloor	No picture
07/09/2015	20:47:11	DEA East Plough Track	S 07 04.4935 W 088 26.9669	4102	left Niskin is closed inside plume (0.3 m above seafloor): SO242-2_D169_NIS1	No picture
07/09/2015	21:06:59	DEA East Plough Track	S 07 04.4946 W 088 26.9717	4101.775	middle Niskin is closed inside plume (0.8 m above seafloor): SO242-2_D169_NIS2	No picture
07/09/2015	21:24:31	DEA East Plough Track	S 07 04.4922 W 088 26.9703	4100.4	right Niskin is closed inside plume (0.5m above seafloor): SO242-2_D169_NIS3	No picture
07/09/2015	21:26:56	DEA East Plough Track	S 07 04.4923 W 088 26.9702	4096.47143	flying up out of the plume to measure its height: up to about 8 m above seafloor	No picture
07/09/2015	21:30:04	DEA East Plough Track	S 07 04.4928 W 088 26.9715	4094.38	flying northward to starting point of plume: plume still visible on the ground	No picture
07/09/2015	21:34:25	DEA East Plough Track	S 07 04.4868 W 088 26.9594	4090.09286	Photo of octopus coming out of the sediment cloud from below	
07/09/2015	21:34:33	DEA East Plough Track	S 07 04.4866 W 088 26.9590	4090.03571	another photo of swimming octopus	
07/09/2015	21:34:54	DEA East Plough Track	S 07 04.4861 W 088 26.9578	4090	another photo of swimming octopus	
07/09/2015	21:35:03	DEA East Plough Track	S 07 04.4859 W 088 26.9575	4090	another photo of swimming octopus	
07/09/2015	21:35:16	DEA East Plough Track	S 07 04.4855 W 088 26.9572	4090.07143	another photo of swimming octopus	
07/09/2015	21:35:31	DEA East Plough Track	S 07 04.4857 W 088 26.9569	4090.1	another photo of swimming octopus	
07/09/2015	21:35:54	DEA East Plough Track	S 07 04.4863 W 088 26.9564	4090.1	Lower HD rec. on to film swimming octopus	No picture
07/09/2015	21:37:07	DEA East Plough Track	S 07 04.4873 W 088 26.9555	4089.94286	Lower HD rec. off	No picture

07/09/2015	21:52:47	DEA East Plough Track	S 07 04.4860 W 088 26.9642	4099.6	Photo of starting position of plume experiment; sediment plume is not visible anymore	
07/09/2015	21:53:25	DEA East Plough Track	S 07 04.4861 W 088 26.9624	4099.68571	more photos of starting position of plume experiment	
07/09/2015	21:53:48	DEA East Plough Track	S 07 04.4863 W 088 26.9617	4099.7	more photos of starting position of plume experiment; End of plume experiment	
07/09/2015	21:55:56	DEA East Plough Track	S 07 04.4895 W 088 26.9561	4100.05714	flying to Chamber 3 (position of beacon 68)	No picture
07/09/2015	22:16:21	DEA East Plough Track	S 07 04.4529 W 088 26.9392	4098.5	fixing Chamber 2 and 3 onto elevator 1	No picture
07/09/2015	22:32:12	DEA East Plough Track	S 07 04.4473 W 088 26.9420	4098.84667	flying to Profiler 1 for pick-up	No picture
07/09/2015	22:36:30	DEA East Plough Track	S 07 04.4554 W 088 26.9228	4098.9	picking up Profiler 1 and bring to elevator 1	No picture
07/09/2015	22:45:34	DEA East Plough Track	S 07 04.4529 W 088 26.9392	4098	fixing Profiler 1 onto elevator 1	No picture
07/09/2015	22:58:39	DEA East Plough Track	S 07 04.4516 W 088 26.9417	4098.3	flying to Profiler 2 for pick-up	No picture
07/09/2015	23:04:35	DEA East Plough Track	S 07 04.4820 W 088 26.9102	4100.32857	picking up Profiler 2	No picture
07/09/2015	23:07:22	DEA East Plough Track	S 07 04.4820 W 088 26.9102	4099.97143	picking up Profiler 2 (programme not finished; sensors still in sediment; cylinder moving up) and bring to elevator 1	No picture
07/09/2015	23:22:13	DEA East Plough Track	S 07 04.4428 W 088 26.9409	4098.84667	fixing Profiler 2 onto elevator 1 and putting beacon 68 onto porch	No picture
07/09/2015	23:46:17	DEA East Plough Track	S 07 04.4398 W 088 26.9415	4097.16667	pulling out floating rope of elevator 1 and flying to Chamber 1 for pick-up	No picture
08/09/2015	00:30:32	DEA East Plough Track	S 07 04.4684 W 088 26.9264	4065.8875	OFF THE BOTTOM	No picture

created 27/09/2015 23:29:59

Dive summary

Kiel 6000 - Dive: 176-1

SO242/2 (RV Sonne)

Date: **09/09/2015**
Observers: **BOETIUS Antje, BOHSUNG Seinab, JANSSEN Felix, MEVENKAMP Lisa, MUELLER Samuel, NORNES Stein, PURSER Autun, WENZHOEFER Frank**
Position: **S 07 04.4812 W 088 26.9142**

Dive duration:

Start: **09/09/2015 13:53:43**
At bottom: **09/09/2015 15:11:00**
Leave bottom: **09/09/2015 23:22:03**
End: **10/09/2015 00:52:45**

Explored sites:

Aims of the Dive:

1. push coring
2. in situ chambers
3. profilers

Required Tools:

1. 16 pushcores
2. suction pump
3. BioBox
4. Magnet T-Stick
5. nodule scoops
6. profiler and chamber on porch

On Elevator:

1. Elevator 2 (beacon 67): 4 respirometers (done)
2. Elevator 1 (beacon 66): 1 profiler, 1 chamber, 1 nodule chamber (fixed to elevator), 2x2 blade cores
3. Elevator 2 up (10.09.2015): 3 CUBEs, 4 respirometers
4. Elevator 1 up (10.09.2015): 1 profiler, 1 chamber, 1 nodule chamber (fixed to elevator, 2x2 blade cores

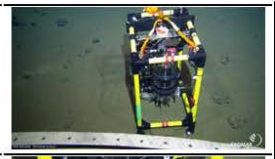
Dive summary:

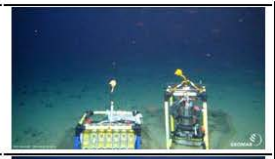
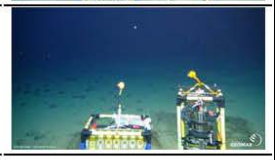
Dive SO242-2_176 (protocol by Frank Wenzhoefer)
The major aim of this dive was to perform in situ flux measurements as well was push core and fauna sampling in the DEA East area. The dive started with the placement of the ROV-Microprofiler MICP1-1 and ROV-Chamber BFC3 on a white spot of the plough track, right next to each other. After taking the second set off in situ tools from the elevator, both - Profiler MICP2-1 and chamber BFC1 – were placed on an undisturbed area. We collected three different nodules – nodule, nodule with sponge and worm and nodule with sponge - for incubation in the nodule incubator "Knolle". We took 14 push cores from a white spot inside the plough track. We replaced both Profiler for a second deployment (MICP1-2 on undisturbed area and MICP2-2 on white patch) and for a third deployment (MICP2-3 on white spot and MICP1-3 on undisturbed area, just 1m next to last meassurement). The last action during this dive was to collect a holothurian, chrinoid, isopode, ophiroid and an unknown object with the slurp gun.

Dive report:

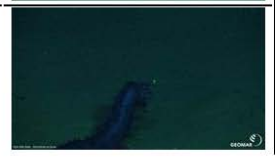
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
09/09/2015	15:11:00	DEA East Plough Track	S 07 04.4779 W 088 26.9218	4098.1	AT THE BOTTOM	No picture
09/09/2015	15:14:28	DEA East Plough Track	S 07 04.4766 W 088 26.9198	4100.8	upper HD on	No picture

09/09/2015	15:22:59	DEA East Plough Track	S 07 04.4762 W 088 26.9190	4102.1	photo of white spot where profiler 1 is placed	
09/09/2015	15:29:24	DEA East Plough Track	S 07 04.4760 W 088 26.9206	4102	turn and put chamber next to profiler on white spot; Chamber 3 placed on ripple with white spot; frontside chamber penetration until ring 10; with two feet sunken deeper on ripple	No picture
09/09/2015	15:34:03	DEA East Plough Track	S 07 04.4762 W 088 26.9190	4102.3	Start Chamber 3 (MPI/AWI) on white spot; So241_2_176_BFC3	No picture
09/09/2015	15:34:50	DEA East Plough Track	S 07 04.4762 W 088 26.9190	4102.6	Lower HD rec. on	No picture
09/09/2015	15:41:29	DEA East Plough Track	S 07 04.4762 W 088 26.9190	4102.8	Start Profiler 1 (MPI/AWI) white spot; So242_2_176_MICP1-1	
09/09/2015	15:41:53	DEA East Plough Track	S 07 04.4762 W 088 26.9190	4102.8	Profiler 1 on white spot edge between ripples, zoomed in picture	
09/09/2015	15:44:44	DEA East Plough Track	S 07 04.4746 W 088 26.9193	4100.7	Lower HD rec. off	No picture
09/09/2015	15:48:38	DEA East Plough Track	S 07 04.4545 W 088 26.9403	4099	Prepare pickup of profiler 2	
09/09/2015	16:02:31	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.5	Photo of selected spot for profiler 2	
09/09/2015	16:02:44	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.5	Photo of selected spot for profiler 2	
09/09/2015	16:05:56	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.9	Profiler 2 placed on seafloor; position about 5 meters from track	

09/09/2015	16:09:47	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102	Start Profiler 2 (MPI/AWI) undisturbed; So242_2_176_MICP2-1	
09/09/2015	16:10:17	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102	Zoomed in photo of profiler 2	
09/09/2015	16:10:53	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102	Screenshot of sonar taken	No picture
09/09/2015	16:30:38	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.62857	Photo of area to place Chamber 1	
09/09/2015	16:31:24	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.8	Lower HD rec. on	No picture
09/09/2015	16:31:51	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.8	Landscape of undisturbed and disturbed track	No picture
09/09/2015	16:31:54	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.8	Lower HD rec. off	No picture
09/09/2015	16:34:25	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.2	Start Chamber 1 (MPI/AWI) on undisturbed area; So242_2_176_BFC 1	
09/09/2015	16:34:47	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.3	Photo of chamber 1 on site; penetration depth ring 15	
09/09/2015	16:35:16	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	landscape behind chamber 1 and profiler 2	
09/09/2015	16:35:44	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	landscape behind chamber 1 and profiler 2	

09/09/2015	16:36:13	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	landscape behind chamber 1 and profiler 2	
09/09/2015	16:36:22	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	landscape behind chamber 1 and profiler 2	
09/09/2015	16:36:56	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	Lower HD rec. on	No picture
09/09/2015	16:37:38	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.4	Video of landscape in area of chamber 1 and profiler 2; HD documenting undisturbed and disturbed area	No picture
09/09/2015	16:39:47	DEA East Plough Track	S 07 04.4748 W 088 26.9196	4102.06667	Lower HD rec. off	No picture
09/09/2015	16:49:07	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.6	Photo of nodule with ophiurid on stalk	
09/09/2015	16:49:24	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.7	Photo of nodule with ophiurid on stalk	
09/09/2015	16:52:13	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.7	Lower HD rec. on	No picture
09/09/2015	16:52:51	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.7	Recording nodule scooping	No picture
09/09/2015	16:54:23	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.8	Nodule sampled	No picture
09/09/2015	16:54:24	DEA East Plough Track	S 07 04.4584 W 088 26.9208	4101.8	Lower HD rec. off	No picture
09/09/2015	17:08:25	DEA East Plough Track	S 07 04.4545 W 088 26.9403	4100.5	Start "Knolle" (MPI/AWI) Nodule in chamber; So242_2_176_knolle1	No picture
09/09/2015	17:16:50	DEA East Plough Track	S 07 04.4572 W 088 26.9351	4100.4	Photo of nodule with sponge	

09/09/2015	17:17:08	DEA East Plough Track	S 07 04.4572 W 088 26.9351	4100.4	Photos of selected nodule with sponge	
09/09/2015	17:17:15	DEA East Plough Track	S 07 04.4572 W 088 26.9351	4100.4	Photos of selected nodule with sponge	
09/09/2015	17:27:16	DEA East Plough Track	S 07 04.4572 W 088 26.9351	4100.23333	Photo of nodule with sponge in scoop	
09/09/2015	17:41:51	DEA East Plough Track	S 07 04.4545 W 088 26.9403	4100.7	Start "Knolle" (MPI/AWI) Nodule with sponge and worm; So242_2_176_knolle2	No picture
09/09/2015	17:59:00	DEA East Plough Track	S 07 04.4729 W 088 26.9205	4100.32857	flying to undisturbed area with profiler 1	No picture
09/09/2015	18:01:47	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.8	Position without nodules to protect sensors for Profiler 1	
09/09/2015	18:02:02	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4101.9	Position for Profiler 1-2 (zoom in)	
09/09/2015	18:04:07	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.6	Fish	No picture
09/09/2015	18:06:51	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4102.9	Start second Profiler 1 (MPI/AWI) measurement in undisturbed arae; So242_2_176_MIC1-2	
09/09/2015	18:08:57	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4103.1	Profiler 1 on spot	
09/09/2015	18:09:30	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4103.1	Profiler 1 close up	

09/09/2015	18:09:57	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4103.1	Profiler 1 : close up picture of senso	
09/09/2015	18:15:12	DEA East Plough Track	S 07 04.4669 W 088 26.9189	4101.73333	area with high nodule density	No picture
09/09/2015	18:20:24	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4100.5	Photo profiler 2 and chamber 1, in background profiler 1	
09/09/2015	18:20:32	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4100.5	Photo profiler 2 and chamber 1, in background profiler 1	
09/09/2015	18:20:51	DEA East Plough Track	S 07 04.4677 W 088 26.9187	4100.68571	Photo profiler 2 and chamber 1, in background profiler 1	
09/09/2015	18:29:13	DEA East Plough Track	S 07 04.4736 W 088 26.9207	4100.78571	position for profiler 2 on white spots	
09/09/2015	18:29:26	DEA East Plough Track	S 07 04.4732 W 088 26.9207	4100.87143	position for profiler 2 on white spots	
09/09/2015	18:31:17	DEA East Plough Track	S 07 04.4739 W 088 26.9189	4102.31429	deployment of profiler 2 stopped; ripple crest was too high, search for new position	No picture
09/09/2015	18:33:20	DEA East Plough Track	S 07 04.4774 W 088 26.9138	4103.17143	Photo Holothurian	
09/09/2015	18:34:32	DEA East Plough Track	S 07 04.4784 W 088 26.9120	4103.2	Photo Holothurian	
09/09/2015	18:34:44	DEA East Plough Track	S 07 04.4782 W 088 26.9117	4103.2	Photo Holothurian	

09/09/2015	18:35:06	DEA East Plough Track	S 07 04.4784 W 088 26.9114	4103.2	Photo Holothurian	
09/09/2015	18:35:50	DEA East Plough Track	S 07 04.4790 W 088 26.9104	4103.2	brittlestar	No picture
09/09/2015	18:38:58	DEA East Plough Track	S 07 04.4800 W 088 26.9088	4104	Photo position for profiler 2 on white spot	
09/09/2015	18:39:07	DEA East Plough Track	S 07 04.4800 W 088 26.9088	4104	Lower HD rec. on	No picture
09/09/2015	18:41:39	DEA East Plough Track	S 07 04.4800 W 088 26.9088	4104.2	Start second Profiler 2 (MPI/AWI) measurement on white sediment patch; profiler slightly tilted; So242_2_176_MICP2-2	
09/09/2015	18:46:20	DEA East Plough Track	S 07 04.4800 W 088 26.9088	4103.24286	Photo profiler 2 close up	
09/09/2015	18:46:51	DEA East Plough Track	S 07 04.4800 W 088 26.9088	4102.64286	Photo profiler 2 close up	
09/09/2015	18:51:26	DEA East Plough Track	S 07 04.4653 W 088 26.9235	4099.75714	Photo Sponge	
09/09/2015	18:51:49	DEA East Plough Track	S 07 04.4646 W 088 26.9232	4099.7	Photo Sponge	
09/09/2015	18:52:21	DEA East Plough Track	S 07 04.4634 W 088 26.9226	4099.7	Photo Sponge	
09/09/2015	18:52:58	DEA East Plough Track	S 07 04.4626 W 088 26.9226	4099.6	Lower HD rec. off	No picture

09/09/2015	18:55:56	DEA East Plough Track	S 07 04.4618 W 088 26.9221	4102.3875	nodule with a white sponge on top. we will scoop it and bring it to the incubaction chamber	
09/09/2015	18:56:31	DEA East Plough Track	S 07 04.4618 W 088 26.9221	4102.6	Lower HD rec. on	No picture
09/09/2015	19:00:39	DEA East Plough Track	S 07 04.4618 W 088 26.9221	4102.6	Photo nodule (about 6cm wide) with sponge	
09/09/2015	19:00:51	DEA East Plough Track	S 07 04.4618 W 088 26.9221	4102.6	Photo nodule (about 6cm wide) with sponge	
09/09/2015	19:02:14	DEA East Plough Track	S 07 04.4618 W 088 26.9221	4101.84286	Lower HD rec. off	No picture
09/09/2015	19:36:40	DEA East Plough Track	S 07 04.4545 W 088 26.9403	4101	nodule + sponge in nodule incubation chamber 3; sponge got slighlty damaged	
09/09/2015	19:36:52	DEA East Plough Track	S 07 04.4545 W 088 26.9403	4101	Start "Knolle" nodule + sponge; So242_2_176_knolle3	
09/09/2015	20:05:23	DEA East Plough Track	S 07 04.4797 W 088 26.9349	4101.1	Holothurian	No picture
09/09/2015	20:06:27	DEA East Plough Track	S 07 04.4841 W 088 26.9268	4101.6	Box core sampling spot	No picture
09/09/2015	20:11:37	DEA East Plough Track	S 07 04.4797 W 088 26.9120	4103.8	Photo white spot for push coring	
09/09/2015	20:11:48	DEA East Plough Track	S 07 04.4797 W 088 26.9120	4103.8	photo white spot	

09/09/2015	20:49:55	DEA East Plough Track	S 07 04.4797 W 088 26.9120	4103.9	Push cores at white spot: 75, 50, 58, 56 (at flank of white hill), 59, 77, 68, 72 (direct on top of white spot), 35, 38, 70, 76, 23 (at flank of white spot), 73 (at flank of white bump), 82 (at disturbed flank of white bump)	
09/09/2015	21:20:19	DEA East Plough Track	S 07 04.4797 W 088 26.9120	4103.7	Photo of push coring area white spots	
09/09/2015	21:23:30	DEA East Plough Track	S 07 04.4832 W 088 26.9109	4101.4	put profiler to new position	No picture
09/09/2015	21:24:58	DEA East Plough Track	S 07 04.4836 W 088 26.9096	4102.14444	Photo of profiler 2 pick up	
09/09/2015	21:28:45	DEA East Plough Track	S 07 04.4811 W 088 26.9078	4102.3	Photo of profiler 2 pick up	
09/09/2015	21:34:50	DEA East Plough Track	S 07 04.4814 W 088 26.9052	4102.8	Asteroid	No picture
09/09/2015	21:35:12	DEA East Plough Track	S 07 04.4814 W 088 26.9052	4102.9	Start third Profiler 2 (MPI/AWI) measurement on white spot; So242_2_176_MICP2-3	
09/09/2015	21:47:40	DEA East Plough Track	S 07 04.4683 W 088 26.9149	4101.6	Photo Profiler 1 after measurement	
09/09/2015	21:51:31	DEA East Plough Track	S 07 04.4683 W 088 26.9149	4101.9	Start third Profiler 1 (MPI/AWI) measurement in undisturbed area; So242_2_176_MICP1-3	
09/09/2015	21:53:22	DEA East Plough Track	S 07 04.4683 W 088 26.9149	4102	Macro photo of new position of profiler 1	

09/09/2015	22:08:36	DEA East Plough Track	S 07 04.4628 W 088 26.9176	4102.1	Photo sponge on nodule	
09/09/2015	22:08:51	DEA East Plough Track	S 07 04.4628 W 088 26.9176	4102.1	sampling nodule but nodule shattered	
09/09/2015	22:25:46	DEA East Plough Track	S 07 04.4503 W 088 26.9239	4100.31429	Photo sampling holoturian with slurp gun	
09/09/2015	22:37:35	DEA East Plough Track	S 07 04.4500 W 088 26.9213	4098.3	unkown worm in water column	
09/09/2015	22:37:52	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4098.3	unkown worm in water column	
09/09/2015	22:41:24	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.4	Photo slurp oph and chrinoid	
09/09/2015	22:42:54	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.4	Photo slurp oph and chrinoid	
09/09/2015	22:44:13	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.3	Photo slurp oph and chrinoid	
09/09/2015	22:48:27	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4099.9	now a sponge and iso are in line for slurmping	No picture
09/09/2015	22:48:41	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100	Photo sponge with isopode	

09/09/2015	22:48:58	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100	Photo sponge with isopode	
09/09/2015	22:49:10	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100	Photo sponge with isopode; sampled with slurp gun	
09/09/2015	22:50:52	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.3	sponge and iso slurped	No picture
09/09/2015	22:54:16	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.03333	Photo ophiroid	
09/09/2015	22:54:24	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.1	Photo ophiroid	
09/09/2015	22:54:40	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.1	Photo ophiroid (close up)	
09/09/2015	22:58:15	DEA East Plough Track	S 07 04.4484 W 088 26.9201	4100.5	Photo ophiroid; sampled with slurp gun	
09/09/2015	23:06:34	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.4	Photo unkown object	
09/09/2015	23:08:11	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.72857	Photo unkown object	
09/09/2015	23:08:29	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.8	Photo unkown object	
09/09/2015	23:09:37	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.9	Lower HD rec. on	No picture

09/09/2015	23:13:43	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.9	Lower HD rec. off	No picture
09/09/2015	23:16:50	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.9	unknown thing collected	No picture
09/09/2015	23:20:19	DEA East Plough Track	S 07 04.4435 W 088 26.9133	4100.8	sponge and rock collected	No picture
09/09/2015	23:22:03	DEA East Plough Track	S 07 04.4449 W 088 26.9156	4094.06667	OFF THE BOTTOM	No picture

created 27/09/2015 23:39:10

Dive summary

Kiel 6000 - Dive: 179-1

SO242/2 (RV Sonne)

Date: **10/09/2015**
Observers: **BOETIUS Antje, HAMANN Kristin, JANSSEN Felix, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 04.4986 W 088 26.8643**

Dive duration:

Start: **10/09/2015 13:35:21**
At bottom: **10/09/2015 15:07:37**
Leave bottom: **11/09/2015 01:44:29**
End: **11/09/2015 03:20:01**

Explored sites:

Aims of the Dive:

1. push and blade coring
2. CUBE experiments
3. in situ chambers
4. profilers

Required Tools:

1. 16 pushcores
2. suction pump
3. BioBox
4. Magnet T-Stick

On Elevator:

1. Elevator 1 (beacon 66): 1 profiler, 1 chamber, 1 nodule chamber (fixed to elevator), 2x2 blade cores, 1 Ekman grab
2. Elevator 2 (beacon 67): 4 respirometers (done)
3. Elevator 1 up (10.09.2015): 2 profiler, 1 chamber, 1 nodule chamber (fixed to elevator), 2x2 blade cores, 1 Ekman grab
4. Elevator 2 up (10.09.2015): 3 CUBEs, 4 respirometers

Dive summary:

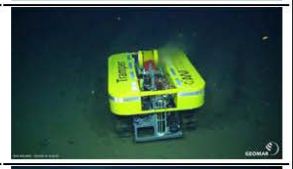
Dive SO242-2_179 (protocol by Andrew Sweetman)
We repositioned profiler 2 over a white spot (Waypoint: Profiler 2 white spot D179). It had damaged electrodes. We then moved to photograph the crawler moving around at the seafloor. Profiler 1 was then repositioned in an undisturbed area next to the track (Waypont: Profiler 1 undisturbed D179). A total of 3 meiofauna push cores were taken in an undisturbed area and one X-ray core in the valley of the track. The CUBES were then sampled after 4 days of incubation, and placed on the elevator. All CUBE sampling (push cores and blade cores) were successful except we lost the holothurian from CUBE 1 and had to resample PC53. An Ekman grab was collected from right next to the elevator for background isotopes. MPI chambers 1 and 3 and profilers 1 and 2 were then picked up and the dive was finished.

Dive report:

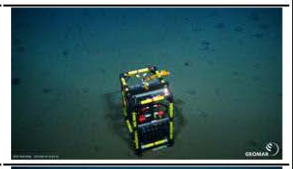
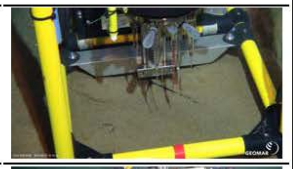
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture

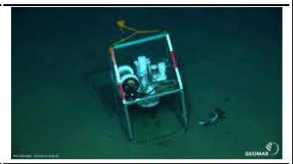
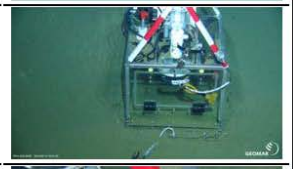
10/09/2015	13:50:41	DEA East Plough Track	S 07 04.4089 W 088 26.8946	411.58	Photo taken of manipulator arm	
10/09/2015	13:51:54	DEA East Plough Track	S 07 04.4079 W 088 26.8931	471.4	Photo taken of manipulator arm and salp	
10/09/2015	15:18:24	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4102.8	many elctrodes are broken on profiler 2, we try once more	No picture
10/09/2015	15:22:38	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4103.7	replace profiler 2 in white spot area to white spot D179	No picture
10/09/2015	15:22:45	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4103.7	Photo taken of profiler	
10/09/2015	15:23:18	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4103.7	Photo taken of damaged electrodes on profiler 2, zoomed in, place between valley	
10/09/2015	15:23:35	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4103.75625	Photo taken of profiler 2, valley released D179 (Waypoint: profiler 2 white spot D179)	
10/09/2015	15:27:13	DEA East Plough Track	S 07 04.4768 W 088 26.8961	4102.3875	go to crawler beacon 63	No picture
10/09/2015	15:31:28	DEA East Plough Track	S 07 04.4710 W 088 26.8849	4100.8	Photo taken of crawler	

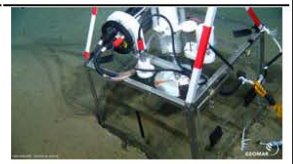
10/09/2015	15:31:37	DEA East Plough Track	S 07 04.4710 W 088 26.8847	4100.8	Photo taken of crawler driving and making a mud cloud	
10/09/2015	15:31:52	DEA East Plough Track	S 07 04.4710 W 088 26.8843	4100.8	Photo taken of crawler	
10/09/2015	15:34:52	DEA East Plough Track	S 07 04.4714 W 088 26.8798	4102	Photo taken of crawler and mud cloud	
10/09/2015	15:35:02	DEA East Plough Track	S 07 04.4715 W 088 26.8796	4102	Photo taken of crawler and start of measurement	
10/09/2015	15:35:13	DEA East Plough Track	S 07 04.4717 W 088 26.8793	4102	Photo taken of crawler and the photo of the crawler taking a picture	
10/09/2015	15:35:21	DEA East Plough Track	S 07 04.4718 W 088 26.8792	4102.03529	Photo taken of crawler and photography of crawler off	
10/09/2015	15:37:19	DEA East Plough Track	S 07 04.4727 W 088 26.8785	4102.1	wait for 10 min and whatch plume hot it moves	No picture
10/09/2015	15:38:41	DEA East Plough Track	S 07 04.4734 W 088 26.8788	4102.1	Photo taken of plume crawler	
10/09/2015	15:44:42	DEA East Plough Track	S 07 04.4741 W 088 26.8765	4102.2	Photo taken of crawler moving	

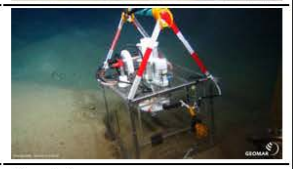
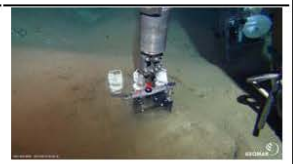
10/09/2015	15:45:14	DEA East Plough Track	S 07 04.4745 W 088 26.8769	4102.2	Photo taken of caterpilar on side of crawler	
10/09/2015	15:45:32	DEA East Plough Track	S 07 04.4745 W 088 26.8773	4102.2	Photo taken of top of crawler	
10/09/2015	15:46:44	DEA East Plough Track	S 07 04.4754 W 088 26.8780	4102.3	Photo taken of crawler moving	
10/09/2015	15:46:52	DEA East Plough Track	S 07 04.4755 W 088 26.8782	4102.31875	Photo taken of crawler moving	
10/09/2015	15:47:07	DEA East Plough Track	S 07 04.4758 W 088 26.8783	4102.4	Photo taken of crawler moving	
10/09/2015	15:47:49	DEA East Plough Track	S 07 04.4767 W 088 26.8781	4102.4	Photo taken of crawler moving again	
10/09/2015	15:49:34	DEA East Plough Track	S 07 04.4783 W 088 26.8776	4102.6	Photo taken of cralwler in dust cloud	
10/09/2015	15:50:30	DEA East Plough Track	S 07 04.4781 W 088 26.8773	4102.53125	Photo taken of crawler and measurment	
10/09/2015	15:50:47	DEA East Plough Track	S 07 04.4780 W 088 26.8772	4102.5	Photo taken of crawler	
10/09/2015	15:52:38	DEA East Plough Track	S 07 04.4757 W 088 26.8774	4102.3	filming crawler cloud	No picture

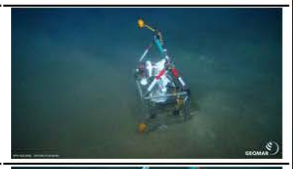
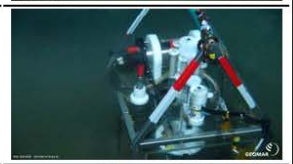
10/09/2015	15:53:12	DEA East Plough Track	S 07 04.4746 W 088 26.8780	4102.225	Photo of seafloor trace	
10/09/2015	15:53:17	DEA East Plough Track	S 07 04.4745 W 088 26.8781	4102.2	Look at trace	No picture
10/09/2015	15:53:41	DEA East Plough Track	S 07 04.4738 W 088 26.8789	4102.2	film trace of crawler (both tracks visible, penetration not deeper ahtn 5-10 cm, only wheels leave trace, not middile part)	No picture
10/09/2015	15:54:46	DEA East Plough Track	S 07 04.4722 W 088 26.8812	4102.04375	Photo taken of trace of crawler	
10/09/2015	15:55:01	DEA East Plough Track	S 07 04.4719 W 088 26.8818	4102	Photo taken of track of crawler	
10/09/2015	15:55:31	DEA East Plough Track	S 07 04.4715 W 088 26.8830	4102	Photo taken of start position of track	
10/09/2015	15:55:48	DEA East Plough Track	S 07 04.4712 W 088 26.8837	4102	Photo taken of start position of track	
10/09/2015	15:56:25	DEA East Plough Track	S 07 04.4704 W 088 26.8850	4101.93125	Photo taken of start position of track	
10/09/2015	15:57:27	DEA East Plough Track	S 07 04.4700 W 088 26.8872	4101.9	Photo taken of start of track with plume	
10/09/2015	15:58:00	DEA East Plough Track	S 07 04.4699 W 088 26.8881	4101.95294	to profiler 1 for replacement	No picture

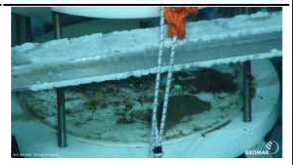
10/09/2015	16:02:22	DEA East Plough Track	S 07 04.4675 W 088 26.9050	4101.5	approach proifler 1	No picture
10/09/2015	16:03:15	DEA East Plough Track	S 07 04.4669 W 088 26.9092	4101.4875	Photo taken of profiler 1	
10/09/2015	16:03:27	DEA East Plough Track	S 07 04.4668 W 088 26.9102	4101.4125	Photo taken of profiler 1 (electrodes on profiler 1 have survived)	
10/09/2015	16:10:09	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.61429	Photo taken of profiler placement at undistrubed spot next to track (Waypoint: Profiler 1 undisturbed D179)	
10/09/2015	16:12:36	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.7	Photo taken of spot close to nodule	
10/09/2015	16:13:00	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.7	Photo of profiler 1 started	
10/09/2015	16:17:39	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.6	go to pushcoring for 3 meiofauna cores (PC81, 67, 60) on undisturbed area close to profiler and track	No picture
10/09/2015	16:23:40	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.9	Photo taken of PC 81, 67, 60	
10/09/2015	16:28:53	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4102.55	go on to take one Xray PC in valley	No picture

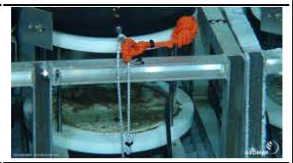
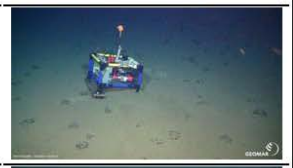
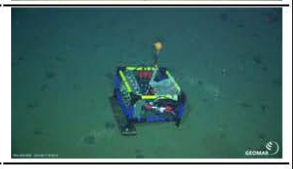
10/09/2015	16:34:27	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4103	Photo taken of PC 9 in ripple valley in track. ripple with whitish stuff on top	
10/09/2015	16:51:46	DEA East Plough Track	S 07 04.4524 W 088 26.9399	4100.53333	only waypoint of Cube2 is on the screen, but other two are in list	No picture
10/09/2015	16:56:04	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4101.1	Photo taken of Cube 2 (algae injected, 1 syringe still down)	
10/09/2015	16:57:50	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4101.6	Photo taken of Cube 2 up close	
10/09/2015	16:59:09	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4101.9125	Photo taken of holothurian on side of Cube 2	
10/09/2015	16:59:32	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4102	Photo taken of holothurian in Cube 2	
10/09/2015	17:02:02	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4102.1	Photo taken of strange animal (possibly crab ingesting salp)	
10/09/2015	17:02:14	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4102.1	Photo taken of strange animal (possibly crab ingesting salp)	
10/09/2015	17:03:15	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4102.4	take push core first for background samples	No picture
10/09/2015	17:07:31	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4102.9	PC 10 picked up for background samples	No picture

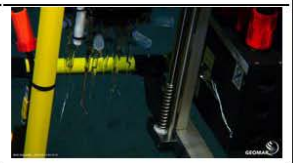
10/09/2015	17:23:59	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103	holo is in slurp gun	No picture
10/09/2015	17:26:22	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103	holo in slurp chamber 1 on ROV	No picture
10/09/2015	17:26:49	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103	Photo taken of open door of Cube 2	
10/09/2015	17:35:02	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103.1	Photo taken of Cube 2 imprint	
10/09/2015	17:44:22	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103.1	Photo taken of PC 83,79,20 and blade core #3 in imprint of Cube 2	
10/09/2015	17:44:22	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103.1	blade corer 3 picked up and placed before the push cores are pulled out	No picture
10/09/2015	17:45:03	DEA East Plough Track	S 07 04.4757 W 088 26.9338	4103.1	Photo taken of blade core positioning with all gear in place	
10/09/2015	18:59:00	DEA East Plough Track	S 07 04.4503 W 088 27.0499	4098.5	flying to cube1	No picture
10/09/2015	19:01:09	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4098.5	Arrived at CUBE 1, stirrer not spinning	No picture
10/09/2015	19:01:17	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4098.62857	2 syringes not fired	No picture
10/09/2015	19:02:42	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4099.2	Photo taken of CUBE 1	

10/09/2015	19:19:10	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4099.4	Photo taken of top of cube 1	
10/09/2015	19:20:50	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	Photo taken of CUBE 1	
10/09/2015	19:24:32	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100.1	PC 24 taken as control	No picture
10/09/2015	19:58:42	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100.1	Cube 1 is lifted but holothurian is lost	No picture
10/09/2015	20:05:28	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	Photo taken of Cube 1 imprint	
10/09/2015	20:05:52	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	Photo taken of Cube 1 imprint	
10/09/2015	20:13:46	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	Photo taken of Cube 1 imprint and PC 55, 61, 49 in imprint	
10/09/2015	20:19:56	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	bladecore 2 is placed and pressed into the sediment in imprint of Cube 1	No picture
10/09/2015	20:20:32	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	Photo taken of blade corer 2 and PC 55, 61, 49 all visible in Cube 1 imprint	
10/09/2015	20:20:36	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4100	bladecore was released	No picture
10/09/2015	20:34:24	DEA East Plough Track	S 07 04.4611 W 088 27.0538	4097.6	we are moving to cube 3 first and will pick up cube 2 later when	No picture

					the dust is gone	
10/09/2015	20:44:06	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4099.28571	Photo taken of Cube 3	
10/09/2015	20:44:25	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4099.2	Photo taken of top of Cube 3	
10/09/2015	20:46:45	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4099.8	Photo taken of top of Cube 3	
10/09/2015	20:54:21	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.6	PC74 taken for background at Cube 3	No picture
10/09/2015	21:03:18	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	holo from Cube 3 was slurped in to chamber 2	No picture
10/09/2015	21:16:02	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of Cube 3 sediment imprint	
10/09/2015	21:16:14	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of Cube 3 sediment imprint	
10/09/2015	21:17:25	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of Cube 3 sediment imprint	
10/09/2015	21:18:00	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of Cube 3 sediment imprint (green layer?)	
10/09/2015	21:18:21	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of green layer and poop in Cube 3 sediment imprint	

10/09/2015	21:21:44	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	PC 53 is pressed into the sediment imprint of Cube 3	No picture
10/09/2015	21:23:41	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	PC 57 is pressed into the sediment imprint of Cube 3	No picture
10/09/2015	21:24:38	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	PC 78 is pressed into the sediment imprint of Cube 3	No picture
10/09/2015	21:25:05	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of PC 53,57, 78 in sediment imprint of Cube 3	
10/09/2015	21:25:17	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	Photo taken of PC 53,57, 79 in sediment imprint of Cube 3	
10/09/2015	21:27:05	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.5	bladecore 4 is lifted and pushed into sediment imprint of Cube 3	No picture
10/09/2015	21:32:51	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.4	we lost PC 53	No picture
10/09/2015	21:34:59	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.4	PC 53 is inserted again into sediment imprint of Cube 3	No picture
10/09/2015	21:35:32	DEA East Plough Track	S 07 04.4722 W 088 27.0501	4100.4	Photo taken of PC53 in imprint of Cube 3	
10/09/2015	22:20:43	DEA East Plough Track	S 07 04.4503 W 088 27.0499	4098	Photo taken ofBICS respirometer 1	
10/09/2015	22:21:25	DEA East Plough Track	S 07 04.4503 W 088 27.0499	4098	Photo taken of BICS respirometer 2	

10/09/2015	22:23:45	DEA East Plough Track	S 07 04.4503 W 088 27.0499	4098.2	Photo taken of BICS respirometer 3	
10/09/2015	23:41:24	DEA East Plough Track	S 07 04.4524 W 088 26.9399	4099.9	Ekman-grab 3 into sediment next to elevator	No picture
10/09/2015	23:53:38	DEA East Plough Track	S 07 04.4524 W 088 26.9399	4100.1	Ekman# 3 and sampled sediment put into biobox 1	No picture
10/09/2015	23:59:56	DEA East Plough Track	S 07 04.4558 W 088 26.9339	4098.08571	Going to profiler 2	No picture
11/09/2015	00:03:11	DEA East Plough Track	S 07 04.4682 W 088 26.9181	4100.3	Approaching chamber 1	No picture
11/09/2015	00:06:13	DEA East Plough Track	S 07 04.4682 W 088 26.9181	4100.7	Photo taken of chamber 1 on its side	
11/09/2015	00:06:31	DEA East Plough Track	S 07 04.4682 W 088 26.9181	4100.41429	Photo taken of chamber 1 on its side	
11/09/2015	00:07:20	DEA East Plough Track	S 07 04.4682 W 088 26.9181	4100.4	Collecting chamber 1	No picture
11/09/2015	00:11:57	DEA East Plough Track	S 07 04.4682 W 088 26.9181	4100.63333	picked up chamber 1	No picture
11/09/2015	00:33:04	DEA East Plough Track	S 07 04.4598 W 088 26.9386	4098.2	going to Profiler 1	No picture
11/09/2015	00:35:11	DEA East Plough Track	S 07 04.4689 W 088 26.9238	4099.35714	Approaching Profiler 1	No picture
11/09/2015	00:38:17	DEA East Plough Track	S 07 04.4695 W 088 26.9138	4101.125	Profiler 1 picked up	No picture
11/09/2015	00:56:53	DEA East Plough Track	S 07 04.4524 W 088 26.9399	4097.125	going to profiler 2 in valley between ripples next to white spot	No picture

11/09/2015	01:05:13	DEA East Plough Track	S 07 04.4857 W 088 26.8992	4102.4	Approaching Profiler 2	No picture
11/09/2015	01:06:21	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4102.4	Photo taken of profiler 2	
11/09/2015	01:09:22	DEA East Plough Track	S 07 04.4800 W 088 26.9003	4102.01429	Profiler 2 is taken up	No picture
11/09/2015	01:11:11	DEA East Plough Track	S 07 04.4712 W 088 26.9146	4100.08571	Photo taken of damaged sensors on profiler 2	
11/09/2015	01:30:21	DEA East Plough Track	S 07 04.4524 W 088 26.9399	4096.45714	Going to Chamber 3	No picture
11/09/2015	01:35:21	DEA East Plough Track	S 07 04.4721 W 088 26.9219	4100.6125	Approaching Chamber 3	No picture
11/09/2015	01:38:20	DEA East Plough Track	S 07 04.4764 W 088 26.9196	4101.8	Chamber 3 taken up	No picture
11/09/2015	01:43:45	DEA East Plough Track	S 07 04.4764 W 088 26.9196	4086.91429	Dive completed.	No picture

created 24/09/2015 00:50:00

Dive summary

Kiel 6000 - Dive: 183-1

SO242/2 (RV Sonne)

Date: **11/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, MEVENKAMP Lisa, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, VONNAHME Tobias**
Position: **S 07 07.511 W 088 27.018**

Dive duration:

Start: **11/09/2015 15:00:38**
At bottom: **11/09/2015 16:30:34**
Leave bottom: **12/09/2015 01:04:46**
End: **12/09/2015 02:05:13**

Explored sites:

Aims of the Dive:

1. Deploy inCUBEator chambers
2. Setup meiofauna ecotoxicology experiment
3. Setup sediment dispenser experiment
4. Slurp gun holothurians (time permitting)
5. 2 Benthic chambers on porch
6. Sediment shaker rack with 5 sediment shakers in right drawer (no senckenberg biobox)
7. 3 control rings for sediment dispension in left drawer (instead of push core rack)

Required Tools:

1. sction pump
2. BioBox

On Elevator:

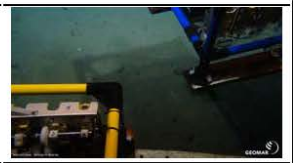
1. 3 CUBEs
2. 6 stacked meiofauna corrals
3. 3 sediment dispersers + 3 rings
4. 4 blade corers
5. 2 six-pack push cores racks (total of 12 push cores)

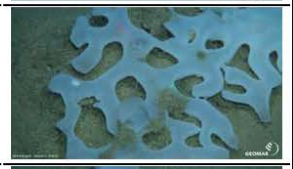
Dive summary:

Dive SO242-2_183 (protocol by Lisa Mevenkamp)
During dive 183 two benthic chambers (BFC 3 and 1) were deployed next to and over a nodule, both deployments were recorded with the lower HD camera. The CUBE experiment (BFC 3) was successfully set up. The Meiofauna ecotoxicology experiment was also set up successfully except that EXP 6 (meiofauna corral 6) was replaced once. The sediment deposition experiment was set up successfully. During the dive waypoints for plastic trash were set to sample at later dives. No samples were taken during this dive.

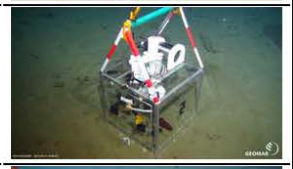
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
11/09/2015	16:30:34	Southern Reference (Outside DEA)	S 07 07.5101 W 088 27.0474	4090.15556	AT THE BOTTOM	No picture
11/09/2015	16:51:23	Southern Reference (Outside DEA)	S 07 07.5160 W 088 27.0257	4115	Lower HD rec. on	No picture

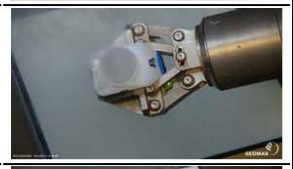
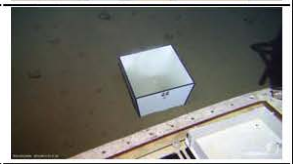
11/09/2015	16:52:00	Southern Reference (Outside DEA)	S 07 07.5160 W 088 27.0257	4115.24286	Photo of nodule for BFC 3 (Benthic chamber 3)	
11/09/2015	16:55:24	Southern Reference (Outside DEA)	S 07 07.5160 W 088 27.0257	4116.5	Lower HD rec. off	No picture
11/09/2015	16:55:59	Southern Reference (Outside DEA)	S 07 07.5160 W 088 27.0257	4116.5	Lower HD rec. on	No picture
11/09/2015	17:01:42	Southern Reference (Outside DEA)	S 07 07.5160 W 088 27.0257	4116.5	BFC 3 (Benthic chamber 3) deployed without nodule	No picture
11/09/2015	17:12:15	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4115.6	Lower HD rec. off	No picture
11/09/2015	17:14:31	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4115.7	Photo of Anemone species	
11/09/2015	17:15:08	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4115.7	Photo of Anemone species	
11/09/2015	17:26:31	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4116.9	BFC 1 (Benthic chamber 1) deployed with nodule	No picture
11/09/2015	17:30:39	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4116.9	Lower HD rec. on	No picture
11/09/2015	17:33:11	Southern Reference (Outside DEA)	S 07 07.5184 W 088 27.0213	4114.97143	Lower HD rec. off	No picture
11/09/2015	18:05:18	Southern Reference (Outside DEA)	S 07 07.5254 W 088 26.9990	4116.58571	Photo of Scotoplanes specimen	
11/09/2015	18:05:34	Southern Reference (Outside DEA)	S 07 07.5257 W 088 26.9987	4116.7	Photo of Scotoplanes specimen	

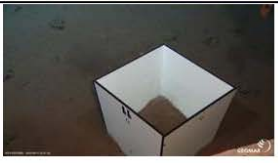
11/09/2015	18:06:11	Southern Reference (Outside DEA)	S 07 07.5266 W 088 26.9986	4116.92857	Photo of Scotoplanes specimen	
11/09/2015	18:11:35	Southern Reference (Outside DEA)	S 07 07.5300 W 088 26.9985	4117.2	Photo of BFC 3 (CUBE 3) deployment	
11/09/2015	18:11:59	Southern Reference (Outside DEA)	S 07 07.5300 W 088 26.9985	4117.2	Photo of Holothurian in BFC 3 (CUBE 3)	
11/09/2015	18:12:12	Southern Reference (Outside DEA)	S 07 07.5300 W 088 26.9985	4117.2	Photo of Holothurian in BFC 3 (CUBE 3)	
11/09/2015	18:16:28	Southern Reference (Outside DEA)	S 07 07.5300 W 088 26.9985	4116.6	Photo of BFC 3 after start (CUBE 3)	
11/09/2015	18:37:22	Southern Reference (Outside DEA)	S 07 07.5148 W 088 27.0264	4114.7	Photo of large Porifera spec.	
11/09/2015	18:37:39	Southern Reference (Outside DEA)	S 07 07.5143 W 088 27.0258	4114.9	Photo of large Porifera spec.	
11/09/2015	18:40:19	Southern Reference (Outside DEA)	S 07 07.5149 W 088 27.0246	4115.4	Photo of amphipod taking shelter under sponge	
11/09/2015	18:40:40	Southern Reference (Outside DEA)	S 07 07.5150 W 088 27.0247	4115.4	Photo of large Porifera spec.	

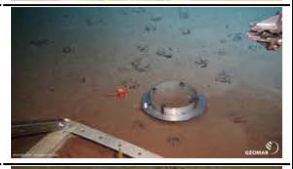
11/09/2015	18:41:04	Southern Reference (Outside DEA)	S 07 07.5154 W 088 27.0250	4115.3	Photo of large Porifera spec.	
11/09/2015	18:41:21	Southern Reference (Outside DEA)	S 07 07.5152 W 088 27.0247	4115.18333	Photo of large Porifera spec.	
11/09/2015	18:49:55	Southern Reference (Outside DEA)	S 07 07.4866 W 088 27.0049	4112.97143	Photo of plastic piece	
11/09/2015	18:52:47	Southern Reference (Outside DEA)	S 07 07.4900 W 088 27.0178	4113	Photo of trash	
11/09/2015	19:02:07	Southern Reference (Outside DEA)	S 07 07.4936 W 088 27.0483	4113.1	Photo of the area, accidental photo	
11/09/2015	19:13:52	Southern Reference (Outside DEA)	S 07 07.5606 W 088 27.0565	4116.9	Photo of Asteroid	
11/09/2015	19:14:03	Southern Reference (Outside DEA)	S 07 07.5607 W 088 27.0564	4116.9	Photo of Asteroid	
11/09/2015	19:19:32	Southern Reference (Outside DEA)	S 07 07.5637 W 088 27.0362	4118.26667	Photo of Holothurian	
11/09/2015	19:22:09	Southern Reference (Outside DEA)	S 07 07.5666 W 088 27.0360	4118.7	Photo of Holothurian swimming away	

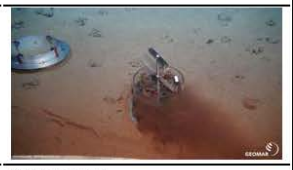
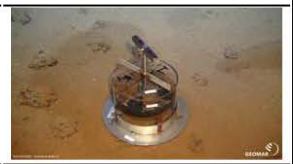
11/09/2015	19:29:54	Southern Reference (Outside DEA)	S 07 07.5705 W 088 27.0102	4118.4	Photo of burrowing Anemone	
11/09/2015	19:50:06	Southern Reference (Outside DEA)	S 07 07.5450 W 088 27.0030	4118.3	Photo of BFC 2 (CUBE 2), zoomed in on Holothurian	
11/09/2015	19:50:42	Southern Reference (Outside DEA)	S 07 07.5450 W 088 27.0030	4118.3	Photo of BFC 2 (CUBE 2)	
11/09/2015	20:23:51	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.67143	Photo of spot for EXP 1 (meiofauna corral)	
11/09/2015	20:26:27	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.9	Photo of EXP 1 (meiofauna corral) placed on seafloor	
11/09/2015	20:26:41	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.9	Photo of EXP 1 (meiofauna corral) placed on seafloor	
11/09/2015	20:28:23	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.9	Photo of spot for EXP 2 (meiofauna corral 2)	
11/09/2015	20:35:31	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.8	Photo of EXP 2 (meiofauna corral 2) placed on seafloor	
11/09/2015	20:37:40	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.8	Photo: distributing Sediment A into EXP 2 (meiofauna corral 2)	

11/09/2015	20:37:58	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.8	Photo: distributing Sediment A into EXP 2 (meiofauna corral 2)	
11/09/2015	20:41:34	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.9	Photo: distributing Sediment A into EXP 2 (meiofauna corral 2)	
11/09/2015	20:47:16	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.8	Photo of EXP 2 (meiofauna corral 2) after sediment dispension	
11/09/2015	20:47:32	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.8	Photo of EXP 2 (meiofauna corral 2) after sediment dispension	
11/09/2015	20:51:15	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0657	4115.7	Photo of spot for EXP 6 (meiofauna corral 6)	
11/09/2015	20:54:35	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo of spot for EXP 6 (meiofauna corral 6)	
11/09/2015	20:56:17	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo of EXP 6 (meiofauna corral 6) placed on seafloor	
11/09/2015	21:02:24	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo: distributing Sediment B into EXP 6 (meiofauna corral 6)	
11/09/2015	21:06:19	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo: distributing Sediment B into EXP 6 (meiofauna corral 6)	

11/09/2015	21:06:37	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo of red jellyfish	
11/09/2015	21:08:06	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo: checking sediment bottle B content	
11/09/2015	21:08:20	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo: checking sediment bottle B content	
11/09/2015	21:11:23	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo of EXP 6 (meiofauna corral 6) after sediment dispension	
11/09/2015	21:11:47	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo of EXP 6 (meiofauna corral 6) after sediment dispension	
11/09/2015	21:13:37	Southern Reference (Outside DEA)	S 07 07.5173 W 088 27.0657	4115.7	Photo: Enteropneusta	
11/09/2015	21:18:24	Southern Reference (Outside DEA)	S 07 07.5187 W 088 27.0628	4115.41667	Photo: Enteropneusta	
11/09/2015	21:52:30	Southern Reference (Outside DEA)	S 07 07.5157 W 088 27.0649	4115.3	Photo of spot for EXP 3 (meiofauna corral 3)	
11/09/2015	21:55:58	Southern Reference (Outside DEA)	S 07 07.5157 W 088 27.0649	4115.4	Photo of EXP 3 (meiofauna corral 3) placed on seafloor	

11/09/2015	22:00:22	Southern Reference (Outside DEA)	S 07 07.5157 W 088 27.0649	4115.3	Photo: distributing Sediment C into EXP 3 (meiofauna corral 3)	
11/09/2015	22:06:02	Southern Reference (Outside DEA)	S 07 07.5157 W 088 27.0649	4115.3	Photo of EXP 3 (meiofauna corral 3) after sediment dispension	
11/09/2015	22:09:26	Southern Reference (Outside DEA)	S 07 07.5137 W 088 27.0642	4115.2	Photo of spot for EXP 5 (meiofauna corral 5)	
11/09/2015	22:13:51	Southern Reference (Outside DEA)	S 07 07.5137 W 088 27.0642	4115.2	Photo of spot for EXP 5 (meiofauna corral 5)	
11/09/2015	22:15:45	Southern Reference (Outside DEA)	S 07 07.5137 W 088 27.0642	4115.1	Photo of EXP 3 (meiofauna corral 3) placed on seafloor	
11/09/2015	22:19:37	Southern Reference (Outside DEA)	S 07 07.5137 W 088 27.0642	4115.1	Photo: distributing Sediment D into EXP 5 (meiofauna corral 5)	
11/09/2015	22:22:43	Southern Reference (Outside DEA)	S 07 07.5137 W 088 27.0642	4115.1	Photo of EXP 5 (meiofauna corral 5) after sediment dispension	
11/09/2015	22:25:26	Southern Reference (Outside DEA)	S 07 07.5115 W 088 27.0644	4115	Photo of spot for EXP 4 (meiofauna corral 4)	
11/09/2015	22:27:49	Southern Reference (Outside DEA)	S 07 07.5115 W 088 27.0644	4114.9	Photo of EXP 4 (meiofauna corral 4) placed on seafloor	

11/09/2015	22:31:38	Southern Reference (Outside DEA)	S 07 07.5115 W 088 27.0644	4114.9	Photo: distributing Sediment E into EXP 4 (meiofauna corral 4)	
11/09/2015	22:37:00	Southern Reference (Outside DEA)	S 07 07.5115 W 088 27.0644	4114.8	Photo of EXP 5 (meiofauna corral 5) after sediment dispension	
11/09/2015	23:04:58	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.1875	Photo of sediment dispenser site, undisturbed	
11/09/2015	23:05:13	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo of sediment dispenser site, undisturbed	
11/09/2015	23:05:19	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo of sediment dispenser site, undisturbed	
11/09/2015	23:12:03	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo: EXP 1 (experimental core 1) placed on seafloor	
11/09/2015	23:12:34	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo: Crab (Parapagurus?)	
11/09/2015	23:17:28	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo: EXP 2 (experimental core 2) placed on seafloor	
11/09/2015	23:23:44	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.2	Photo: EXP 3 (experimental core 3) placed on seafloor	

11/09/2015	23:41:57	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4116.05714	Photo: EXP 3 (sediment dispenser 3) deployed	
11/09/2015	23:53:01	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.7	Lower HD rec. on	No picture
11/09/2015	23:56:59	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.5	Photo: EXP 2 (sediment dispenser 2) deployed	
11/09/2015	23:57:19	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.3	Lower HD rec. off	No picture
12/09/2015	00:08:06	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.9	Lower HD rec. on	No picture
12/09/2015	00:08:10	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.9	Photo: EXP 1 (sediment dispenser 1) deployed	
12/09/2015	00:09:19	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.57143	Photo: EXP 1 (sediment dispenser 1) deployed	
12/09/2015	00:10:23	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4114.9	Lower HD rec. off	No picture
12/09/2015	00:18:24	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.4	Photo: EXP 4 (experimental core 4) placed on seafloor	
12/09/2015	00:23:40	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.7	Photo: EXP 5 (experimental core 5) placed on seafloor	
12/09/2015	00:23:47	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4115.7	Photo: EXP 5 (experimental core 5) placed on seafloor	

12/09/2015	00:29:07	Southern Reference (Outside DEA)	S 07 07.5085 W 088 27.0201	4111.2	Photo: EXP 6 (experimental core 6) placed on seafloor	
12/09/2015	00:29:48	Southern Reference (Outside DEA)	S 07 07.5063 W 088 27.0213	4101.5	OFF THE BOTTOM	No picture
12/09/2015	01:04:46	Southern Reference (Outside DEA)	S 07 07.5094 W 088 27.0641	2693.97778	Upper HD off	No picture

created 27/09/2015 23:47:01

Dive summary

Kiel 6000 - Dive: 188-1

SO242/2 (RV Sonne)

Date: **12/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, LINS Lidia, MEVENKAMP Lisa, SWEETMAN Andrew, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 07.511 W 088 27.020**

Dive duration:

Start: **12/09/2015 14:47:15**
At bottom: **12/09/2015 16:27:19**
Leave bottom: **12/09/2015 23:21:47**
End: **13/09/2015 00:54:11**

Explored sites:

Aims of the Dive:

1. Setup holothurian ecotoxicology experiment
2. Setup respirometers
3. (finish sediment dispenser experiment)

Required Tools:

1. 6 sediment shakers in sediment shaker rack
2. slurp gun
3. 2 Chambers on porch (down)

On Elevator:

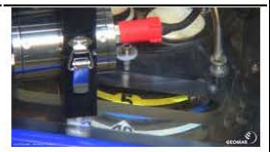
1. 9 ophiurid corrals
2. 4 respirometers
3. 2 sixpacks with push corers

Dive summary:

Dive SO242-2_188 (protocol by Alastair Brown)
This dive deployed experimental equipment in the Southern Reference (Outside DEA) area (outside DEA): we deployed benthic flux chambers on sediment with/without polymetallic nodule, completed the deployment of the sediment dispenser experiment, deployed the holothurian ecotoxicology experiment, and deployed the BICS respirometers. Benthic flux chamber 2 was placed on sediment with a polymetallic nodule and benthic flux chamber 4 was placed on sediment without a polymetallic nodule, adjacent to benthic flux chamber 2. Sediment dispensers were recovered without disturbing the experimental cores. 6 ecotox holothurian enclosure corrals were deployed over Scotoplanes sp. and treated: 2 without addition of artificial sediment, 2 with addition of artificial sediment, and 2 with addition of artificial sediment spiked with copper. 2 ecotox holothurian enclosure corrals were deployed over Benthodytes sp. and treated: 1 with addition of artificial sediment, 1 with addition of artificial sediment spiked with copper. 1 Scotoplanes sp., 1 Synallactes sp., and 1 Paeleopatides sp. were sampled with suction pump and delivered to the BICS respirometers chambers; 1 BICS chamber was used to determine background respiration.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
12/09/2015	16:27:19	Southern Reference (Outside DEA)	S 07 07.5128 W 088 27.0388	4185.3	AT THE BOTTOM	No picture
12/09/2015	16:28:33	Southern Reference (Outside DEA)	S 07 07.5149 W 088 27.0389	4192.24286	UpperHD on	No picture
12/09/2015	16:46:31	Southern Reference (Outside DEA)	S 07 07.5129 W 088 27.0378	4194.3	Polychaete	No picture

12/09/2015	16:58:46	Southern Reference (Outside DEA)	S 07 07.5185 W 088 27.0262	4197.2	Photo of nodule for chamber experiment (with Ipnops sp. in background)	
12/09/2015	16:59:14	Southern Reference (Outside DEA)	S 07 07.5189 W 088 27.0257	4197.3	Photo of nodule for chamber experiment (with Ipnops sp. in background)	
12/09/2015	17:01:30	Southern Reference (Outside DEA)	S 07 07.5189 W 088 27.0257	4197.4	SO242-2_D188_BFC#2	No picture
12/09/2015	17:04:31	Southern Reference (Outside DEA)	S 07 07.5161 W 088 27.0242	4197.4	Benthic flux chamber 2 placed on sediment with polymetallic nodule. Benthic flux chamber 2 sediment surface flush with green ring = 12.5 cm overlying water height	
12/09/2015	17:10:53	Southern Reference (Outside DEA)	S 07 07.5189 W 088 27.0257	4197.4	SO242-2_D188_BFC#4	No picture
12/09/2015	17:11:23	Southern Reference (Outside DEA)	S 07 07.5189 W 088 27.0257	4197.4	Benthic flux chamber 4 placed on sediment without polymetallic nodule, adjacent to benthic flux chamber 2. Benthic flux chamber 4 sediment surface between white and blue ring = ca. 8.0 cm overlying water height.	
12/09/2015	17:20:14	Southern Reference (Outside DEA)	S 07 07.5081 W 088 27.0244	4194.8	Photo of sediment dispenser experiment site	
12/09/2015	17:20:28	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0241	4194.8	Photo of sediment dispenser experiment site	
12/09/2015	17:27:18	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0208	4196.7	EXP-SED_DISP recovered.	No picture
12/09/2015	17:36:30	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0208	4196.9	Photo of sediment deposition core 1	
12/09/2015	17:36:54	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0208	4196.6875	Photo of sediment deposition core 2	

12/09/2015	17:38:35	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0208	4195.8125	Photo of fish: Coryphaenoides sp.	
12/09/2015	17:44:37	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0208	4196.37778	Photo of sediment deposition core 3	
12/09/2015	17:48:10	Southern Reference (Outside DEA)	S 07 07.5234 W 088 27.0216	4195.46667	Actinian on sediment adjacent to boxcore disturbance.	No picture
12/09/2015	17:48:37	Southern Reference (Outside DEA)	S 07 07.5251 W 088 27.0209	4195.6	Fish	No picture
12/09/2015	18:11:59	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0419	4195.7	SO242-2_D188_EXP-HOLOCORRAL#1	No picture
12/09/2015	18:11:59	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0419	4195.7	SO242-2_D188_EXP-HOLOCORRAL#1-holothurian	No picture
12/09/2015	18:18:48	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0419	4196.9	Ecotox holothurian enclosure corral #1 placed over Scotoplanes sp. and sediment K (artificial sediment spiked with copper) dispensed.	No picture
12/09/2015	18:24:15	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0419	4196.9	Photo of ecotox holothurian enclosure corral #1 with Scotoplanes sp. as sediment K (artificial sediment spiked with copper) is dispensed.	
12/09/2015	18:25:59	Southern Reference (Outside DEA)	S 07 07.5214 W 088 27.0419	4196.9	Scotoplanes sp. begins swimming as sediment is dispensed	No picture
12/09/2015	18:43:40	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	Photo of Benthodytes sp. targeted for ecotox holothurian enclosure corral #2	
12/09/2015	18:45:40	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	SO242-2_D188_EXP-HOLOCORRAL#2	No picture
12/09/2015	18:45:40	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	SO242-2_D188_EXP-HOLOCORRAL#2-holothurian	No picture
12/09/2015	18:49:32	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	Ecotox holothurian enclosure corral #2 placed over Benthodytes sp. and sediment G (artificial sediment) dispensed.	No picture

12/09/2015	18:51:11	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	Photo of ecotox holothurian enclosure corral #2 with Benthodytes sp. as sediment G (artificial sediment) is dispensed.	
12/09/2015	18:53:33	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.5	Benthodytes sp. begins swimming as sediment is dispensed.	No picture
12/09/2015	19:01:24	Southern Reference (Outside DEA)	S 07 07.5232 W 088 27.0216	4197.18571	Photo of ecotox holothurian enclosure corral #2	
12/09/2015	19:33:46	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0185	4197	Photo of Scotoplanes sp. targeted for ecotox holothurian enclosure corral #3	
12/09/2015	19:36:08	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0185	4197.6	SO242-2_D188_EXP-HOLOCORRAL#3	No picture
12/09/2015	19:36:08	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0185	4197.6	SO242-2_D188_EXP-HOLOCORRAL#3-holothurian	No picture
12/09/2015	19:41:51	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0185	4197.7	Ecotox holothurian enclosure corral #3 placed over Scotoplanes sp. and sediment H (artificial sediment) dispensed.	No picture
12/09/2015	19:42:53	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0185	4197.7	Photo of ecotox holothurian enclosure corral #3 as sediment H (artificial sediment) is dispensed.	
12/09/2015	19:49:43	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.58333	Photo of Scotoplanes sp. targeted for ecotox holothurian enclosure corral #4	
12/09/2015	19:49:55	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.6	SO242-2_D188_EXP-HOLOCORRAL#4	No picture
12/09/2015	19:49:55	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.6	SO242-2_D188_EXP-HOLOCORRAL#4-holothurian	No picture
12/09/2015	19:59:02	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.7	Ecotox holothurian enclosure corral #4 placed over Scotoplanes sp. and sediment J (artificial sediment spiked with copper) dispensed.	No picture
12/09/2015	20:02:00	Southern Reference (Outside	S 07 07.5218 W 088	4197.7	Scotoplanes sp. begins swimming as sediment is dispensed.	No picture

		DEA)	27.0150			
12/09/2015	20:03:24	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.7	Photo of ecotox holothurian enclosure corral #4 with Scotoplanes sp. swimming.	
12/09/2015	20:03:32	Southern Reference (Outside DEA)	S 07 07.5218 W 088 27.0150	4197.7	Photo of ecotox holothurian enclosure corral #4 with Scotoplanes sp. swimming.	
12/09/2015	20:20:26	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4198.4	Photo of Scotoplanes sp. targeted for ecotox holothurian enclosure corral #5	
12/09/2015	20:20:50	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4198.55714	Photo of Lophoeneteropneusta spiral	
12/09/2015	20:21:16	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4198.74286	SO242-2_D188_EXP-HOLOCORRAL#5	No picture
12/09/2015	20:21:16	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4198.74286	SO242-2_D188_EXP-HOLOCORRAL#5-holothurian	No picture
12/09/2015	20:23:20	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4199.2	Ecotox holothurian enclosure corral #5 placed over Scotoplanes sp. and sediment F (artificial sediment) dispensed.	No picture
12/09/2015	20:27:31	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4199.2	Photo of ecotox holothurian enclosure corral #5 as sediment F (artificial sediment) is dispensed.	
12/09/2015	20:34:52	Southern Reference (Outside DEA)	S 07 07.5518 W 088 27.0378	4199	Photo of ecotox holothurian enclosure corral #5 with Scotoplanes sp.	
12/09/2015	20:46:01	Southern Reference (Outside DEA)	S 07 07.5716 W 088 27.0169	4200.2	Photo of Scotoplanes sp. targeted for ecotox holothurian enclosure corral #6	
12/09/2015	20:46:14	Southern Reference (Outside DEA)	S 07 07.5716 W 088 27.0169	4200.2	SO242-2_D188_EXP-HOLOCORRAL#6	No picture
12/09/2015	20:46:14	Southern Reference (Outside DEA)	S 07 07.5716 W 088 27.0169	4200.2	SO242-2_D188_EXP-HOLOCORRAL#6-holothurian	No picture

12/09/2015	20:46:14	Southern Reference (Outside DEA)	S 07 07.5716 W 088 27.0169	4200.2	Ecotox holothurian enclosure corral #6 placed over Scotoplanes sp. and no sediment dispensed.	No picture
12/09/2015	20:48:26	Southern Reference (Outside DEA)	S 07 07.5716 W 088 27.0169	4200	Photo of ecotox holothurian enclosure corral #6 with Scotoplanes sp.	
12/09/2015	20:52:56	Southern Reference (Outside DEA)	S 07 07.5416 W 088 27.0292	4197.62857	Photo of fish: Coryphaenoides sp.	
12/09/2015	20:56:31	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197.1	BICS released in preparation for holothurians	No picture
12/09/2015	20:58:51	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197.3	SO242-2_D188_ISCHAM-BICS#4	No picture
12/09/2015	20:59:34	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197.3	BICS chamber #4 closed for background respiration	No picture
12/09/2015	21:08:01	Southern Reference (Outside DEA)	S 07 07.5256 W 088 27.0488	4196.5	Fish	No picture
12/09/2015	21:08:34	Southern Reference (Outside DEA)	S 07 07.5256 W 088 27.0521	4196.4	Mid-low	No picture
12/09/2015	21:09:00	Southern Reference (Outside DEA)	S 07 07.5250 W 088 27.0558	4196.5	Crinoid	No picture
12/09/2015	21:09:11	Southern Reference (Outside DEA)	S 07 07.5249 W 088 27.0576	4196.5	Ophiuroid	No picture
12/09/2015	21:13:11	Southern Reference (Outside DEA)	S 07 07.5265 W 088 27.0736	4196.5	Photo of unknown object: litter?	
12/09/2015	21:13:21	Southern Reference (Outside DEA)	S 07 07.5266 W 088 27.0741	4196.5	Litter	No picture
12/09/2015	21:13:30	Southern Reference (Outside DEA)	S 07 07.5266 W 088 27.0750	4196.5	Other/unknown	No picture
12/09/2015	21:18:23	Southern Reference (Outside DEA)	S 07 07.5388 W 088 27.0882	4196.8	Holothurian	No picture

12/09/2015	21:19:32	Southern Reference (Outside DEA)	S 07 07.5413 W 088 27.0810	4197.2	Photo of anthozoan	
12/09/2015	21:19:32	Southern Reference (Outside DEA)	S 07 07.5413 W 088 27.0810	4197.2	Holothurian	No picture
12/09/2015	21:23:25	Southern Reference (Outside DEA)	S 07 07.5477 W 088 27.0627	4198	Ophiuroid	No picture
12/09/2015	21:23:40	Southern Reference (Outside DEA)	S 07 07.5480 W 088 27.0618	4198	Photo of brisingid on an alcyonid	
12/09/2015	21:24:01	Southern Reference (Outside DEA)	S 07 07.5486 W 088 27.0603	4198.0875	Photo of ophiuroid on a coral	
12/09/2015	21:26:06	Southern Reference (Outside DEA)	S 07 07.5491 W 088 27.0545	4198.2	Photo of Benthodytes sp. targeted for ecotox holothurian enclosure corral #7	
12/09/2015	21:28:02	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.5	Photo of Benthodytes sp. targeted for ecotox holothurian enclsoure corral #7	
12/09/2015	21:29:04	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.6	SO242-2_D188_EXP-HOLOCORRAL#7	No picture
12/09/2015	21:29:04	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.6	SO242-2_D188_EXP-HOLOCORRAL#7-holothurian	No picture
12/09/2015	21:30:01	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.7	Sediment disturbed as ecotox holothurian enclosure corral #7 is placed over Benthodytes sp. and Benthodytes sp. begins swimming. Ecotox holothurian enclosure corral #7 moved to undisturbed sediment with Benthodytes sp. swimming.	No picture
12/09/2015	21:32:06	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.8	Photo of ecotox holothurian enclosure corral #7 as sediment I (artificial sediment spiked with copper) is prepared for dispensing.	

12/09/2015	21:34:54	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.8	Photo of ecotox holothurian enclosure corral #7 as sediment I (artificial sediment spiked with copper) is dispensed.	
12/09/2015	21:36:54	Southern Reference (Outside DEA)	S 07 07.5496 W 088 27.0517	4198.8	Photo of ecotox holothurian enclosure corral #7	
12/09/2015	21:40:36	Southern Reference (Outside DEA)	S 07 07.5492 W 088 27.0470	4197.97143	Sponge	No picture
12/09/2015	21:44:20	Southern Reference (Outside DEA)	S 07 07.5368 W 088 27.0339	4197.9	Photo of Scotoplanes sp. targeted for ecotox holothurian enclosure corral #8.	
12/09/2015	21:46:09	Southern Reference (Outside DEA)	S 07 07.5368 W 088 27.0339	4198.1	SO242-2_D188_EXP-HOLOCORRAL#8	No picture
12/09/2015	21:46:09	Southern Reference (Outside DEA)	S 07 07.5368 W 088 27.0339	4198.1	SO242-2_D188_EXP-HOLOCORRAL#8-holothurian	No picture
12/09/2015	21:47:58	Southern Reference (Outside DEA)	S 07 07.5368 W 088 27.0339	4198.4	Ecotox holothurian enclosure corral #8 placed over Scotoplanes sp. and no sediment dispensed.	No picture
12/09/2015	22:00:21	Southern Reference (Outside DEA)	S 07 07.5195 W 088 27.0367	4196	Holothurian	No picture
12/09/2015	22:24:57	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197	SO242-2_D188_ISCHAM-BICS#2	No picture
12/09/2015	22:24:57	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197	SO242-2_D188_ISCHAM-BICS#2-holothurian	No picture
12/09/2015	22:25:37	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.8	Scotoplanes sp. sampled with suction pump for delivery to BICS.	No picture
12/09/2015	22:31:04	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.9	Scotoplanes sp. delivered to BICS chamber 2 and chamber 2 closed.	No picture
12/09/2015	22:35:34	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197.31429	Scotoplanes sp. in BICS chamber 2 is swimming	No picture
12/09/2015	22:41:53	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.5	Fish	No picture

12/09/2015	22:42:25	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.4	Photo of Synallactes sp. targeted for BICS.	
12/09/2015	22:43:55	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.5	Photo of Synallactes sp. targeted for BICS.	
12/09/2015	22:44:06	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.56667	SO242-2_D188_ISCHAM-BICS#1	No picture
12/09/2015	22:44:06	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.56667	SO242-2_D188_ISCHAM-BICS#1-holothurian	No picture
12/09/2015	22:46:21	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197	Synallactes sp. sampled with suction pump for delivery to BICS.	No picture
12/09/2015	22:51:11	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.9	Synallactes sp. delivered to BICS chamber 1 and chamber 1 closed.	No picture
12/09/2015	22:53:55	Southern Reference (Outside DEA)	S 07 07.5172 W 088 27.0427	4196	Anemone	No picture
12/09/2015	22:55:04	Southern Reference (Outside DEA)	S 07 07.5103 W 088 27.0407	4195.4	Anemone	No picture
12/09/2015	22:57:58	Southern Reference (Outside DEA)	S 07 07.4999 W 088 27.0346	4195.2	Photo of Paeleopatides sp. targeted for BICS.	
12/09/2015	22:58:33	Southern Reference (Outside DEA)	S 07 07.4994 W 088 27.0338	4195.4	Photo of Paeleopatides sp. targeted for BICS.	
12/09/2015	22:58:56	Southern Reference (Outside DEA)	S 07 07.4996 W 088 27.0333	4195.5	Photo of Paeleopatides sp. targeted for BICS.	
12/09/2015	23:01:14	Southern Reference (Outside DEA)	S 07 07.5013 W 088 27.0345	4195.4	SO242-2_D188_ISCHAM-BICS#3	No picture
12/09/2015	23:01:14	Southern Reference (Outside DEA)	S 07 07.5013 W 088 27.0345	4195.4	SO242-2_D188_ISCHAM-BICS#3-holothurian	No picture
12/09/2015	23:01:23	Southern Reference (Outside DEA)	S 07 07.5018 W 088 27.0351	4195.4	Paeleopatides sp. sampled with suction pump for delivery to BICS.	No picture

12/09/2015	23:07:06	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.7	Paeleopatides sp. delivered to BICS chamber 3 and chamber 3 closed.	No picture
12/09/2015	23:07:27	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4196.7	Paeleopatides sp. in chamber 3 swimming	No picture
12/09/2015	23:11:12	Southern Reference (Outside DEA)	S 07 07.5240 W 088 27.0439	4197.1	BICS chambers secured	No picture
12/09/2015	23:21:47	Southern Reference (Outside DEA)	S 07 07.5273 W 088 27.0415	4175	OFF THE BOTTOM	No picture
12/09/2015	23:23:40	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0429	4111.56667	Upper HD off	No picture

created 24/09/2015 19:57:20

Dive summary

Kiel 6000 - Dive: 191-1

SO242/2 (RV Sonne)

Date: **13/09/2015**
Observers: **BOETIUS Antje, LINKE Peter, NORNES Stein, PURSER Autun**
Position: **S 07 05.394 W 088 26.766**

Dive duration:

Start: **13/09/2015 14:20:45**
At bottom: **13/09/2015 15:59:28**
Leave bottom: **13/09/2015 18:43:00**
End: **13/09/2015 20:26:25**

Explored sites:

Aims of the Dive:

1. Inspect LBL-mooring from SO242/1 that did not release properly (if releasing is easy: do it, if not: plan how to do it on follow-up dive)
2. Scan anything/everything with Underwater Hyperspectral Imager

Required Tools:

1. Underwater Hyperspectral Imager on Riggmaster
2. Small Biobox with lid on push core rack
3. Nodule scoop
4. MAPR for Water optical properties (turbidity)

On Elevator:

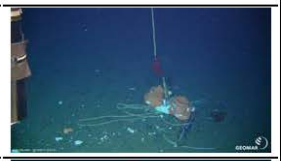
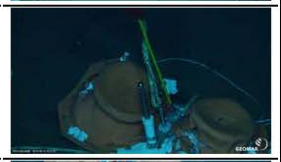
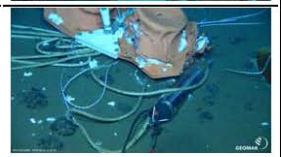
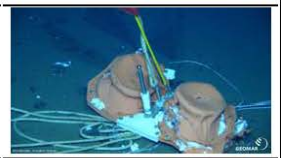
1. None

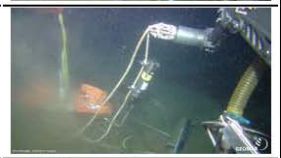
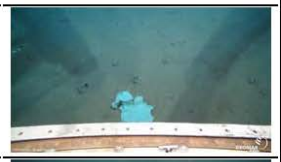
Dive summary:

Dive SO242-2_191 (protocol by Stein Nornes)
The LBL-mooring was located within 20 minutes after reaching the seafloor. The release failure was determined to be caused by the buoyancy elements imploding. Since the cutting implements of the Rigmaster had been removed to accommodate the Hyperspectral Imager, the instruments could not be recovered on this dive. Both Transponder and MAPR seem to be intact after visual inspection, and a recovery dive will be planned towards the end of the cruise. The hyperspectral scanning was successful, although an unfortunate electrical interaction between the UHI and lower HD-camera led to the HD-camera malfunctioning. Three scanned nodules were successfully recovered and one ROV-team-leader's birthday was appropriately celebrated.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
13/09/2015	15:59:28	LBL-Mooring / Hyperspectral Camera	S 07 05.4033 W 088 26.7747	4176.31429	AT THE BOTTOM	No picture
13/09/2015	16:06:02	LBL-Mooring / Hyperspectral Camera	S 07 05.3993 W 088 26.7721	4191.88571	Moving towards reported mooring position	No picture
13/09/2015	16:16:23	LBL-Mooring / Hyperspectral Camera	S 07 05.3724 W 088 26.7654	4193.22857	Plastic litter found	No picture
13/09/2015	16:16:58	LBL-Mooring / Hyperspectral	S 07 05.3705 W 088	4193.3	Sonar target detected, moving towards	No picture

		Camera	26.7660		it	
13/09/2015	16:21:01	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4194.58462	Arrived at the mooring, starting inspection. Overview photo of the site	
13/09/2015	16:21:27	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4194.69231	Closer look at the imploded buoyancy elements	
13/09/2015	16:22:39	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.05833	Closer look at instruments. LBL centre/right of image, MAPR half covered by ropes and white part of buoyancy elements in left of image	
13/09/2015	16:22:48	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.13077	Another photo of the buoyancy elements	
13/09/2015	16:24:01	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.54444	Closeup of the MAPR (partially obscured by ropes and buoyancy elements in centre of image)	
13/09/2015	16:26:55	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4196.2	Starting visual inspection of the transponder	No picture
13/09/2015	16:29:37	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4196.2	Lifting up the LBL-transponder for a closer look at release mechanism. It remains unreleased	
13/09/2015	16:32:15	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4196.2	Overview photo from different angle. Preparing visual inspection of MAPR	
13/09/2015	16:36:28	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.77	Pulled the MAPR out from under the collapsed mooring and holding it up for inspection	

13/09/2015	16:36:47	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.675	Another photo of the MAPR	
13/09/2015	16:36:57	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.625	Another photo of the MAPR	
13/09/2015	16:38:42	LBL-Mooring / Hyperspectral Camera	S 07 05.3519 W 088 26.7715	4195.07143	Mooring inspection finished, MAPR and LBL-transponder placed next to mooring, ready for recovery dive with cutting implements.	
13/09/2015	16:43:15	LBL-Mooring / Hyperspectral Camera	S 07 05.3724 W 088 26.7617	4194.05	Preparing hyperspectral survey, adjusting lights, camera settings and ROV altitude. Forward looking HD and Pantilt recording to be used in post-processing of hyperspectral data.	No picture
13/09/2015	16:48:48	LBL-Mooring / Hyperspectral Camera	S 07 05.3724 W 088 26.7617	4194.5	Photo of the plastic piece selected for first scanning	
13/09/2015	16:50:06	LBL-Mooring / Hyperspectral Camera	S 07 05.3724 W 088 26.7617	4194.5	Photo of the plastic piece selected for first scanning	
13/09/2015	16:50:13	LBL-Mooring / Hyperspectral Camera	S 07 05.3724 W 088 26.7617	4194.5	Photo of the plastic piece selected for first scanning	
13/09/2015	17:01:51	LBL-Mooring / Hyperspectral Camera	S 07 05.3766 W 088 26.7628	4194.6	Altitude adjusted to 1 m.	No picture

13/09/2015	17:54:27	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.3	Photo of nodules intended for sampling	
13/09/2015	17:54:39	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.3	Photo of nodules intended for sampling	
13/09/2015	17:55:51	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.4	Photo of nodules intended for sampling	
13/09/2015	17:55:51	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.4	Marking of the sampled nodules in situ. Closest nodule was attempted to be sampled by only using gripper on arm, but turned out to be too big for that approach. The other two were collected with a nodule scoop.	
13/09/2015	18:04:04	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.7	Nodule 1 with a lot of biofilm	
13/09/2015	18:05:40	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.7	COLBOX: Photo of drawer with Nodule 1 in 2nd most space from the right (large chamber)	
13/09/2015	18:09:57	LBL-Mooring / Hyperspectral Camera	S 07 05.3873 W 088 26.7684	4194.7	Underside of Nodule 2 with sipinculids(?)	
13/09/2015	18:18:45	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.66667	Hyperspectral Imager turned off, LED off	No picture
13/09/2015	18:19:24	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.7	Photo of Nodule 3 with sponge (and crinoid?)	

13/09/2015	18:19:24	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.7	Same as above, Nodule 3 marked.	
13/09/2015	18:23:49	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.8	ROV-team-leader Fritz Abegg opening his birthday present	
13/09/2015	18:33:58	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.8	Nodule 3 with sponge (and crinoid?)	
13/09/2015	18:34:07	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.8	Nodule 3 with sponge (and crinoid?)	
13/09/2015	18:34:15	LBL-Mooring / Hyperspectral Camera	S 07 05.3862 W 088 26.7768	4194.8	Nodule 3 with sponge (and crinoid?)	
13/09/2015	18:43:00	LBL-Mooring / Hyperspectral Camera	S 07 05.3876 W 088 26.7776	4186.925	OFF THE BOTTOM	No picture

created 24/09/2015 01:07:45

Dive summary

Kiel 6000 - Dive: 196-1

SO242/2 (RV Sonne)

Date: **15/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, LINS Lidia, MEVENKAMP Lisa, SWEETMAN Andrew, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 07.511 W 088 27.020**

Dive duration:

Start: **15/09/2015 13:46:32**
At bottom: **15/09/2015 15:26:14**
Leave bottom: **15/09/2015 23:43:07**
End: **16/09/2015 01:20:38**

Explored sites:

Aims of the Dive:

1. CUBE experiments
2. Meiofauna ecotox corrals

Required Tools:

1. 6 sediment shakers in sediment shaker rack
2. slurp gun
3. 2 Chambers on porch (down)

On Elevator:

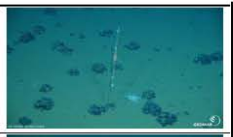
1. 9 ophiurid corrals
2. 4 respirometers
3. 2 sixpacks with push corers

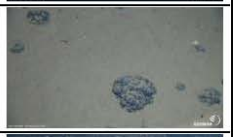
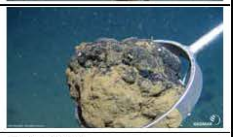
Dive summary:

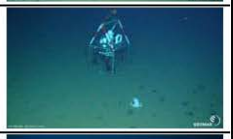
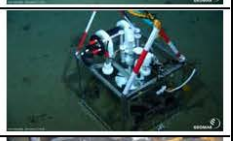
Dive SO242-2_196 (protocol by Sophie Paul)
This dive was carried out in the Southern Reference (Outside DEA) outside the DEA. The aim of the dive was to set up nodule incubation chambers, to carry out CUBE experiments, to pick up and sample the meiofauna ecotoxicology corrals and to take one push core for pore water rhizone sampling. We deployed three chambers for nodule incubation experiments. One nodule with a sponge (chamber 3), one nodule without sponge (chamber 2) and one nodule with part of a xenophyophore (chamber 1) were placed into the incubation chambers. In each CUBE (2 and 3), one holothurian, three push cores and one blade core were taken. One blade core next to CUBE 3 was taken as a reference. Algae deposition in CUBE 2 was clearly visible. Six meiofauna corrals were successfully picked up and three push cores taken in each corral. Lastly, chamber 1 and chamber 3, with and without nodule respectively, were collected.

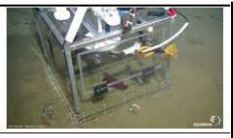
Dive report:

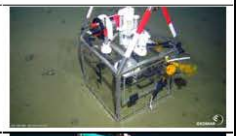
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
15/09/2015	15:26:14	Southern Reference (Outside DEA)	S 07 07.5274 W 088 27.0517	4192.9	AT THE BOTTOM	No picture
15/09/2015	15:37:51	Southern Reference (Outside DEA)	S 07 07.5239 W 088 27.0453	4196.4	photo of chamber 3 opened	
15/09/2015	15:44:32	Southern Reference (Outside DEA)	S 07 07.5142 W 088 27.0391	4194.91429	photo of amphipods and ophiuroid on stalk	
15/09/2015	15:44:52	Southern Reference (Outside DEA)	S 07 07.5141 W 088 27.0388	4195.1	photo of amphipods and ophiuroid on stalk	

15/09/2015	15:45:36	Southern Reference (Outside DEA)	S 07 07.5134 W 088 27.0383	4195.41667	photo of amphipods and ophiuroid on stalk	
15/09/2015	15:45:59	Southern Reference (Outside DEA)	S 07 07.5132 W 088 27.0383	4195.5	photo of amphipods and ophiuroid on stalk	
15/09/2015	15:46:31	Southern Reference (Outside DEA)	S 07 07.5131 W 088 27.0384	4195.6	photo of amphipods and ophiuroid on stalk	
15/09/2015	15:46:59	Southern Reference (Outside DEA)	S 07 07.5128 W 088 27.0385	4195.6	photo of amphipods and ophiuroid on stalk	
15/09/2015	15:48:35	Southern Reference (Outside DEA)	S 07 07.5123 W 088 27.0390	4195.6	photo of sponge on nodule; this nodule will be collected for chamber 3 (SO242-2_D196_ISCHAM3-nodule)	
15/09/2015	15:54:49	Southern Reference (Outside DEA)	S 07 07.5109 W 088 27.0392	4195.925	photo of nodule with sponge, collected on scoop	
15/09/2015	15:55:14	Southern Reference (Outside DEA)	S 07 07.5110 W 088 27.0392	4195.475	photo of nodule with sponge, collected on scoop	
15/09/2015	16:01:51	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.4	nodule with sponge and hydrozoa put in chamber 3	No picture
15/09/2015	16:04:29	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.4	start of chamber 3: 11:03 (SO242-2_D196_ISCHAM3)	No picture
15/09/2015	16:09:53	Southern Reference (Outside DEA)	S 07 07.5126 W 088 27.0402	4194.5	photo taken of fish	
15/09/2015	16:10:08	Southern Reference (Outside DEA)	S 07 07.5121 W 088 27.0401	4194.4	photo taken of fish	
15/09/2015	16:10:21	Southern Reference (Outside DEA)	S 07 07.5117 W 088 27.0401	4194.4	photo taken of fish	
15/09/2015	16:10:45	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0403	4194.4	photo taken of fish	

15/09/2015	16:10:54	Southern Reference (Outside DEA)	S 07 07.5111 W 088 27.0403	4194.4	photo taken of fish	
15/09/2015	16:11:22	Southern Reference (Outside DEA)	S 07 07.5107 W 088 27.0406	4194.4	photo taken of fish	
15/09/2015	16:11:43	Southern Reference (Outside DEA)	S 07 07.5102 W 088 27.0411	4194.4	photo taken of fish	
15/09/2015	16:11:59	Southern Reference (Outside DEA)	S 07 07.5100 W 088 27.0413	4194.3	photo taken of fish	
15/09/2015	16:17:48	Southern Reference (Outside DEA)	S 07 07.5089 W 088 27.0461	4196	photo of nodule for chamber 2	
15/09/2015	16:22:07	Southern Reference (Outside DEA)	S 07 07.5099 W 088 27.0451	4196	photo of nodule for chamber 2 in scoop (SO242-2_D196_ISCHAM2-nodule)	
15/09/2015	16:22:31	Southern Reference (Outside DEA)	S 07 07.5099 W 088 27.0454	4195.98333	photo of nodule for chamber 2 in scoop	
15/09/2015	16:28:01	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.3	nodule placed in chamber 2	No picture
15/09/2015	16:28:08	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.3	nodule is upside down	No picture
15/09/2015	16:28:51	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.3	chamber 2 start: 11:28 (SO242-2_D196_ISCHAM2)	No picture
15/09/2015	16:35:09	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4195.08571	photo taken of stalked sponge	
15/09/2015	16:35:22	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4195	photo taken of stalked sponge	
15/09/2015	16:36:39	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4194.9	photo of nodule with xeno for chamber 1 (SO242-2_D196_ISCHAM1-nodule)	

15/09/2015	16:36:49	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4194.9	photo of nodule with xeno for chamber 1	
15/09/2015	16:38:41	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4195.57333	photo of nodule with xeno for chamber 1	
15/09/2015	16:41:44	Southern Reference (Outside DEA)	S 07 07.5054 W 088 27.0407	4195.8	photo of PC 28 in sediment (SO242-2_D196_PUC28)	
15/09/2015	16:47:30	Southern Reference (Outside DEA)	S 07 07.5046 W 088 27.0411	4195.2	photo of nodule (xeno mostly lost because nodule hit ROV porch) for chamber 1	
15/09/2015	16:48:14	Southern Reference (Outside DEA)	S 07 07.5053 W 088 27.0421	4194.9	photo of nodule (xeno mostly lost because nodule hit ROV porch) for chamber 2	
15/09/2015	16:53:43	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0451	4196.3	start chamber 1: 11:53 (SO242-2_D196_ISCHAM1)	No picture
15/09/2015	17:16:04	Southern Reference (Outside DEA)	S 07 07.5428 W 088 27.0084	4197.2	photo of cube 2 and octopus	
15/09/2015	17:16:31	Southern Reference (Outside DEA)	S 07 07.5429 W 088 27.0065	4197.23333	photo of cube 2 and octopus	
15/09/2015	17:17:33	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4197.2	photo of cube 2 and octopus	
15/09/2015	17:18:48	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4197.46667	photo of cube 2, holothurian is at the bottom	
15/09/2015	17:26:00	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of holothurian in cube 2	
15/09/2015	17:26:20	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of holothurian in cube 2	

15/09/2015	17:26:49	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of holothurian in cube 2	
15/09/2015	17:35:04	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	holothurian of cube 2 is slurped in chamber 1 of ROV carussel (SO242-2_D183_BFC_CUBE#2-holothurian)	No picture
15/09/2015	17:40:28	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of area where cube 2 was placed and holothurian feces	
15/09/2015	17:40:40	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of area where cube 2 was placed and holothurian feces	
15/09/2015	17:41:03	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of area where cube 2 was placed and holothurian feces	
15/09/2015	17:41:23	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of area where cube 2 was placed and holothurian feces	
15/09/2015	17:41:35	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:41:47	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:41:57	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:42:07	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:42:16	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:42:26	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	

15/09/2015	17:42:37	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:42:47	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:42:56	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	a collection of pictures of the sediment surface where algae deposition is cleary visible	
15/09/2015	17:55:10	Southern Reference (Outside DEA)	S 07 07.5409 W 088 27.0033	4198.8	photo of cube 2 area, pushcores 60 (SO242-2_D196_PUC60), 26 (SO242-2_D196_PUC26), 45 (SO242-2_D196_PUC45) and blade core 1 (SO242-2_D196_BCROV1) in sediment	
15/09/2015	18:12:15	Southern Reference (Outside DEA)	S 07 07.5183 W 088 27.0337	4195.9	cube 2 placed on elevator 1	No picture
15/09/2015	18:25:17	Southern Reference (Outside DEA)	S 07 07.5183 W 088 27.0337	4196.1	bladecore 1 placed in biobox on elevator 1	No picture
15/09/2015	18:26:52	Southern Reference (Outside DEA)	S 07 07.5183 W 088 27.0337	4196.2	photo of bladecore 3+4 in biobox on elevator is taken	
15/09/2015	18:34:35	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4196.74286	we arrived at cube 3	No picture
15/09/2015	18:35:04	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4196.9	stirrer plate plate stirres	No picture
15/09/2015	18:35:25	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4197	algae injected	No picture
15/09/2015	18:35:33	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4197.07143	syringes released	No picture
15/09/2015	18:37:25	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4197.8	photo of cube 3	
15/09/2015	18:38:32	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.1	photo of cube 3	
15/09/2015	18:38:51	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.15	photo of cube 3	

15/09/2015	18:42:00	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	holo was slurped in (SO242-2_D183_BFC_CUBE#3-holothurian)	No picture
15/09/2015	18:45:05	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	it is unclear wether the holo is in the sampling pot	No picture
15/09/2015	18:51:36	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of area where cube 3 was placed	
15/09/2015	18:51:47	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of area where cube 3 was placed	
15/09/2015	18:52:06	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of area where cube 3 was placed	
15/09/2015	18:52:49	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of area where cube 3 was placed	
15/09/2015	19:00:54	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of pushcore 76, 78, 47 (a little bit disturbed when pressing into the sediment) and bladecore in sediment	
15/09/2015	19:01:41	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.3	photo of pushcore 76 (SO242-1_D196_PUC76), 78 (SO242-1_D196_PUC78), 47 (SO242-1_D196_PUC47) and bladecore 3 (SO242-2_D196_BCROV3) in sediment	
15/09/2015	19:09:52	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.4	background bladecore (SO242-2_D196_BCROV?) is taken next to the cube 3 incuabtion location	No picture
15/09/2015	19:17:16	Southern Reference (Outside DEA)	S 07 07.5289 W 088 26.9972	4198.4	photo of pushcore 81 (SO242-2_D196_PUC81), 33 (SO242-2_D196_PUC33), 69 (SO242-2_D196_PUC69) and bladecore 2 (SO242-2_D196_BCROV2) in sediment	
15/09/2015	19:36:45	Southern Reference (Outside DEA)	S 07 07.5183 W 088 27.0337	4196.05	cube 3 is placed on elevator 1	No picture
15/09/2015	19:57:42	Southern Reference (Outside DEA)	S 07 07.5222 W 088 27.0668	4195.18333	photo of meiofauna corrals	
15/09/2015	20:09:43	Southern Reference (Outside DEA)	S 07 07.5222 W 088 27.0668	4197	photo of corral 1 (SO242-2_D183_EXP-MEIOCORRAL#1) with pushcores 52 (SO242-2_D196_PUC52), 65 (SO242-2_D196_PUC65), 63 (SO242-2_D196_PUC63)	

15/09/2015	20:09:54	Southern Reference (Outside DEA)	S 07 07.5222 W 088 27.0668	4197	photo of corral 1 with pushcores 52, 65, 63	
15/09/2015	20:26:32	Southern Reference (Outside DEA)	S 07 07.5222 W 088 27.0668	4197.1	photo of corral 2 (SO242-2_D183_EXP-MEIOCORRAL#2) with pushcores 9 (SO242-2_D196_PUC9), 58 (SO242-2_D196_PUC58), 80 (SO242-2_D196_PUC80)	
15/09/2015	20:33:31	Southern Reference (Outside DEA)	S 07 07.5222 W 088 27.0668	4197.1	photo of site of corral 2	
15/09/2015	21:00:22	Southern Reference (Outside DEA)	S 07 07.5186 W 088 27.0681	4197	photo of corral 6 (SO242-2_D183_EXP-MEIOCORRAL#6) with pushcores 20 (SO242-2_D196_PUC20), 57 (SO242-2_D196_PUC57), 74 (SO242-2_D196_PUC74)	
15/09/2015	21:00:41	Southern Reference (Outside DEA)	S 07 07.5186 W 088 27.0681	4197	photo of corral 6 with pushcores 20, 57, 74	
15/09/2015	21:05:09	Southern Reference (Outside DEA)	S 07 07.5186 W 088 27.0681	4196.88333	photo of corral 6 site after sampling	
15/09/2015	21:07:21	Southern Reference (Outside DEA)	S 07 07.5165 W 088 27.0665	4196.3	photo of corral 3	
15/09/2015	21:13:25	Southern Reference (Outside DEA)	S 07 07.5165 W 088 27.0665	4196.9	photo of corral 3 (SO242-2_D183_EXP-MEIOCORRAL#3) with pushcores 24 (SO242-2_D196_PUC24), 49 (SO242-2_D196_PUC49), 83 (SO242-2_D196_PUC83)	
15/09/2015	21:17:25	Southern Reference (Outside DEA)	S 07 07.5165 W 088 27.0665	4196.9	photo of corral 3 site	
15/09/2015	21:36:36	Southern Reference (Outside DEA)	S 07 07.5146 W 088 27.0650	4195.4	photo of corral 5	
15/09/2015	21:36:51	Southern Reference (Outside DEA)	S 07 07.5146 W 088 27.0650	4195.65	photo of corral 6	
15/09/2015	21:42:33	Southern Reference (Outside DEA)	S 07 07.5146 W 088 27.0650	4196.8	photo of corral 5 (SO242-2_D183_EXP-MEIOCORRAL#5) with pushcores 10 (SO242-2_D196_PUC10), 61 (SO242-2_D196_PUC61), 67 (SO242-2_D196_PUC67)	

15/09/2015	21:48:14	Southern Reference (Outside DEA)	S 07 07.5126 W 088 27.0658	4196.3	photo of corral 4 before sampling	
15/09/2015	21:48:23	Southern Reference (Outside DEA)	S 07 07.5126 W 088 27.0658	4196.3	photo of corral 4 before sampling	
15/09/2015	21:53:45	Southern Reference (Outside DEA)	S 07 07.5126 W 088 27.0658	4196.65	photo of corral 4 (SO242-2_D183_EXP_MEIOCORRAL#4)with pushcore 79 (SO242-2_D196_PUC79), 53 (SO242-2_D196_PUC53), 18 (SO242-2_D196_PUC18)	
15/09/2015	22:29:12	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4196.3	photo of chamber 1 and 3 in position on seafloor	
15/09/2015	22:31:14	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.28333	lower HD not available, penetration depth of chamber unknown	No picture
15/09/2015	22:32:11	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.7	Photo of chamber 3 with all syringes released (collected) (SO242-2_D???_BFC3)	
15/09/2015	22:32:24	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.7	Photo of chamber 3 with all syringes released	
15/09/2015	22:34:44	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.7	Close up photo of chamber 3 patch	
15/09/2015	22:34:59	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.7	Close up photo of chamber 3 patch	
15/09/2015	22:35:18	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4197.6	Photo of chamber 3 patch	
15/09/2015	22:37:18	Southern Reference (Outside DEA)	S 07 07.5151 W 088 27.0273	4196.14286	photo of macrofauna	
15/09/2015	22:54:38	Southern Reference (Outside DEA)	S 07 07.5167 W 088 27.0236	4196.68333	photo of chamber 2 & 4 LED still flashing!	

15/09/2015	22:55:52	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4196.9	photo of chamber 1 (collected) (SO242-2_D???_BFC1)	
15/09/2015	22:56:07	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4196.91429	photo of chamber 1	
15/09/2015	22:56:40	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4197.2	photo of chamber 1	
15/09/2015	23:00:17	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4198	photo of chamber 1 patch w. nodule	
15/09/2015	23:00:25	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4198	photo of chamber 1 patch w. nodule	
15/09/2015	23:05:33	Southern Reference (Outside DEA)	S 07 07.5174 W 088 27.0190	4198	photo of nodule in scoop with dirt (SO242-2_D???_BFC1-nodule)	
15/09/2015	23:43:07	Southern Reference (Outside DEA)	S 07 07.5103 W 088 27.0296	4182.51429	OFF THE BOTTOM	No picture

created 27/09/2015 23:56:40

Dive summary

Kiel 6000 - Dive: 198-1

SO242/2 (RV Sonne)

Date: **16/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, LINS Lidia, MEVENKAMP Lisa, VONNAHME Tobias**
Position: **S 07 07.511 W 088 27.020**

Dive duration:

Start: **16/09/2015 13:42:27**
At bottom: **16/09/2015 15:18:23**
Leave bottom: **16/09/2015 22:11:25**
End: **16/09/2015 23:50:41**

Explored sites:

Aims of the Dive:

1. Sample holothurian ecotoxicology experiment
2. Slurp gun holothurians (time permitting)
3. Bring back chambers

Required Tools:

1. Slurp gun
2. Senckenberg biobox
3. 16 push cores
4. nodule collectors
5. one sixpack pushcores on porch (down)
6. 2 chambers on porch (up)

On Elevator:

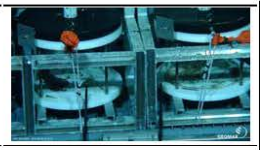
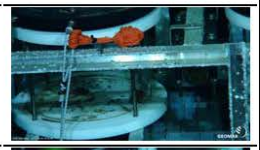
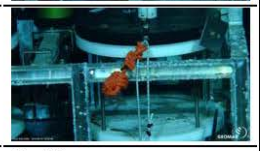
1. Elevator 2 up (beacon 66): 8 holothurian corrals (2 stacks), 1 nodule chamber, 4 respirometers, 3 sixpack with pushcores

Dive summary:

Dive SO242-2_198 (protocol by Alastair Brown)
This dive sampled experiments deployed in the Southern Reference (Outside DEA) area (outside DEA) on dive SO242-2_198 and sampled plastic litter. 1 Scotoplanes sp. was sampled from each of 6 ecotox holothurian enclosure corral treatments: 2 without addition of artificial sediment, 2 with addition of artificial sediment, and 2 with addition of artificial sediment spiked with copper. 1 Benthodytes sp. was sampled from each of 2 ecotox holothurian enclosure corral treatments: 1 with addition of artificial sediment, 1 with addition of artificial sediment spiked with copper. 2 push cores were sampled from each ecotox holothurian enclosure corral treatments. Plastic litter was sampled. Benthic flux chamber 2 and 4 were recovered, with a polymetallic nodule from benthic flux chamber 2.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
16/09/2015	15:18:00	Southern Reference (Outside DEA)	S 07 07.5373 W 088 27.0571	4186.71429	AT THE BOTTOM	No picture
16/09/2015	15:20:00	Southern Reference (Outside DEA)	S 07 07.5382 W 088 27.0577	4194.8	Upper HD on	No picture
16/09/2015	15:33:00	Southern Reference (Outside DEA)	S 07 07.5263 W 088 27.0451	4196.2	SO242-2_D188_ISCHAM-BICS	No picture
16/09/2015	15:34:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.2	Synallactes sp. in BICS chamber #1 is active	No picture

16/09/2015	15:34:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.2	Photo of BICS chamber #3 & #1	
16/09/2015	15:35:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.2	Paeleopatides sp. in BICS chamber #3 is active	No picture
16/09/2015	15:35:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.3	Photo of BICS chamber #1	
16/09/2015	15:36:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.4	Photo of BICS chamber #2	
16/09/2015	15:36:00	Southern Reference (Outside DEA)	S 07 07.5242 W 088 27.0406	4196.4	Scotoplanes sp. in BICS chamber #2 is active	No picture
16/09/2015	15:38:00	Southern Reference (Outside DEA)	S 07 07.5230 W 088 27.0391	4196.3	SO242-2_D188_EXP-HOLOCORRAL#1	No picture
16/09/2015	15:39:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.2	Photo of ecotox holothurian enclosure corral #1 with Scotoplanes sp.	
16/09/2015	15:40:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.2	Photo of ecotox holothurian enclosure corral #1 with Scotoplanes sp.	
16/09/2015	15:40:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.2	Scotoplanes sp. off sediment in upper corner of corral	No picture
16/09/2015	15:45:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.3	SO242-2_D188_EXP-HOLOCORRAL#1-holothurian sampled with suction pump: container #1 & #2	No picture
16/09/2015	15:50:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.2	Photo of ecotox holothurian enclosure corral #1	
16/09/2015	15:56:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	Ecotox holothurian enclosure corral #1 moved to allow pushcoring	No picture
16/09/2015	15:57:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.78	Photo of ecotox holothurian enclosure corral #1 sediment before pushcoring	

16/09/2015	16:00:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	SO242-2_D198_PUC32	No picture
16/09/2015	16:01:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	SO242-2_D198_PUC71	No picture
16/09/2015	16:02:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	Photo of ecotox holothurian enclosure corral #1 sediment with pushcores	
16/09/2015	16:07:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	Holothurian	No picture
16/09/2015	16:08:00	Southern Reference (Outside DEA)	S 07 07.5206 W 088 27.0401	4196.7	Photo of ecotox holothurian enclosure corral #1 sediment after pushcoring	
16/09/2015	16:19:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4195.4	Holothurian	No picture
16/09/2015	16:23:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4196.1	SO242-2_D188_EXP-HOLOCORRAL#2	No picture
16/09/2015	16:26:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4196.5	Photo of ecotox holothurian enclosure corral #2 with Benthodytes sp.	
16/09/2015	16:26:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4196.5	Photo of ecotox holothurian enclosure corral #2 with Benthodytes sp.	
16/09/2015	16:26:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4196.5	Benthodytes sp. on sediment	No picture
16/09/2015	16:27:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4196.5	Shrimp	No picture
16/09/2015	16:34:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197.1	SO242-2_D188_EXP-HOLOCORRAL#2-holothurian sampled with suction pump: container #3	No picture
16/09/2015	16:38:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Photo of ecotox holothurian enclosure corral #2	
16/09/2015	16:38:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Ecotox holothurian enclosure corral #2 moved to allow pushcoring	No picture

16/09/2015	16:42:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Photo of ecotox holothurian enclosure corral #2 sediment before pushcoring	
16/09/2015	16:43:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	SO242-2_D198_PUC51	No picture
16/09/2015	16:44:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	SO242-2_D198_PUC37	No picture
16/09/2015	16:45:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Photo of ecotox holothurian enclosure corral #2 sediment with pushcores	
16/09/2015	16:50:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Photo of ecotox holothurian enclosure corral #2 sediment after pushcoring	
16/09/2015	16:50:00	Southern Reference (Outside DEA)	S 07 07.5212 W 088 27.0196	4197	Photo of ecotox holothurian enclosure corral #2 sediment after pushcoring	
16/09/2015	16:57:00	Southern Reference (Outside DEA)	S 07 07.5263 W 088 27.0451	4195.7	Shrimp	No picture
16/09/2015	17:02:00	Southern Reference (Outside DEA)	S 07 07.5263 W 088 27.0451	4196	---Hydrozoa---------	No picture
16/09/2015	17:02:00	Southern Reference (Outside DEA)	S 07 07.5263 W 088 27.0451	4196	Corymorphidae	No picture
16/09/2015	17:02:00	Southern Reference (Outside DEA)	S 07 07.5263 W 088 27.0451	4196	---Hydrozoa---------	No picture
16/09/2015	17:12:00	Southern Reference (Outside DEA)	S 07 07.5290 W 088 27.0406	4196.16	Holothurian	No picture
16/09/2015	17:13:00	Southern Reference (Outside DEA)	S 07 07.5292 W 088 27.0303	4196.4	Crinoid	No picture
16/09/2015	17:15:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4196.3	SO242-2_D188_EXP-HOLOCORRAL#3	No picture
16/09/2015	17:15:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4196.4	Photo of ecotox holothurian enclosure corral #3 with Scotoplanes sp.	

16/09/2015	17:15:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4196.45	Scotoplanes sp. swimming	No picture
16/09/2015	17:20:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	SO242-2_D188_EXP-HOLOCORRAL#3-holothurian sampled with suction pump: container #4	No picture
16/09/2015	17:22:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3	
16/09/2015	17:24:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Ecotox holothurian enclosure corral #3 moved to allow pushcoring	No picture
16/09/2015	17:25:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3 sediment before pushcoring	
16/09/2015	17:25:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3 sediment before pushcoring	
16/09/2015	17:27:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	SO242-2_D198_PUC68	No picture
16/09/2015	17:28:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	SO242-2_D198_PUC55	No picture
16/09/2015	17:28:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3 sediment with pushcores	
16/09/2015	17:31:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3 sediment after pushcoring	
16/09/2015	17:32:00	Southern Reference (Outside DEA)	S 07 07.5238 W 088 27.0172	4197.4	Photo of ecotox holothurian enclosure corral #3 sediment after pushcoring	
16/09/2015	17:39:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	SO242-2_D188_EXP-HOLOCORRAL#4	No picture
16/09/2015	17:41:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4 with Scotoplanes sp.	

16/09/2015	17:41:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Scotoplanes sp. swimming	No picture
16/09/2015	17:43:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	SO242-2_D188_EXP-HOLOCORRAL#4-holothurian sampled with suction pump: container #5	No picture
16/09/2015	17:46:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4	
16/09/2015	17:48:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Ecotox holothurian enclosure corral #4 moved to allow pushcoring	No picture
16/09/2015	17:49:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4 sediment before pushcoring	
16/09/2015	17:49:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4 sediment before pushcoring	
16/09/2015	17:52:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	SO242-2_D198_PUC36	No picture
16/09/2015	17:52:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Sediment slightly disturbed during coring	No picture
16/09/2015	17:53:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	SO242-2_D198_PUC34	No picture
16/09/2015	17:53:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4 sediment with pushcores	
16/09/2015	17:56:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4197.1	Photo of ecotox holothurian enclosure corral #4 sediment after pushcoring	
16/09/2015	17:59:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4196.18333	Sponge	No picture
16/09/2015	18:00:00	Southern Reference (Outside DEA)	S 07 07.5168 W 088 27.0162	4196.13333	Sponge	No picture
16/09/2015	18:02:00	Southern Reference (Outside DEA)	S 07 07.5267 W 088 27.0354	4195.7	Shrimp	No picture

16/09/2015	18:02:00	Southern Reference (Outside DEA)	S 07 07.5273 W 088 27.0371	4195.7	Holothurian	No picture
16/09/2015	18:17:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4197.6	Squid	No picture
16/09/2015	18:18:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4197.6	SO242-2_D188_EXP-HOLOCORRAL#5	No picture
16/09/2015	18:18:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4197.7	Photo of ecotox holothurian enclosure corral #5 with Scotoplanes sp.	
16/09/2015	18:19:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4197.83333	Photo of ecotox holothurian enclosure corral #5 with Scotoplanes sp.	
16/09/2015	18:19:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4197.98333	Photo of ecotox holothurian enclosure corral #5 with Scotoplanes sp.	
16/09/2015	18:21:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Scotoplanes sp. on sediment	No picture
16/09/2015	18:23:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	SO242-2_D188_EXP-HOLOCORRAL#5-holothurian sampled with suction pump: container #6	No picture
16/09/2015	18:25:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Photo of ecotox holothurian enclosure corral #5	
16/09/2015	18:26:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Ecotox holothurian enclosure corral #5 moved to allow pushcoring	No picture
16/09/2015	18:27:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Photo of ecotox holothurian enclosure corral #5 sediment before pushcoring	
16/09/2015	18:28:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Photo of Lophoenteropneusta spiral over nodule	
16/09/2015	18:30:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	SO242-2_D198_PUC59	No picture
16/09/2015	18:31:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	SO242-2_D198_PUC3	No picture

16/09/2015	18:31:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Photo of ecotox holothurian enclosure corral #5 sediment with pushcores	
16/09/2015	18:33:00	Southern Reference (Outside DEA)	S 07 07.5506 W 088 27.0378	4198.8	Photo of ecotox holothurian enclosure corral #5 sediment after pushcoring	
16/09/2015	18:41:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4199.04	SO242-2_D188_EXP-HOLOCORRAL#6	No picture
16/09/2015	18:41:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4199.28	Photo of ecotox holothurian enclosure corral #6 with Scotoplanes sp.	
16/09/2015	18:44:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200	SO242-2_D188_EXP-HOLOCORRAL#6-holothurian sampled with suction pump: container #7	No picture
16/09/2015	18:50:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	Ecotox holothurian enclosure corral #6 moved to allow pushcoring	No picture
16/09/2015	18:50:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	Photo of ecotox holothurian enclosure corral #6 sediment before pushcoring	
16/09/2015	18:51:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	SO242-2_D198_PUC25	No picture
16/09/2015	18:51:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	SO242-2_D198_PUC5	No picture
16/09/2015	18:53:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	Photo of ecotox holothurian enclosure corral #6 sediment with pushcores	
16/09/2015	18:53:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	PUC25 overfull; additional pushcore required	No picture
16/09/2015	18:58:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	SO242-2_D198_PUC21	No picture
16/09/2015	18:58:00	Southern Reference (Outside DEA)	S 07 07.5727 W 088 27.0180	4200.1	Photo of ecotox holothurian enclosure corral #6 sediment with pushcores	
16/09/2015	19:06:00	Southern Reference (Outside DEA)	S 07 07.5293 W 088 27.0340	4194.64	Crinoid	No picture

16/09/2015	19:27:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4197.1	SO242-2_D188_EXP-HOLOCORRAL#8	No picture
16/09/2015	19:27:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4197.1	Photo of ecotox holothurian enclosure corral #8 with Scotoplanes sp.	
16/09/2015	19:27:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4197.14	Scotoplanes sp. swimming	No picture
16/09/2015	19:27:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4197.2	Photo of ecotox holothurian enclosure corral #8 with Scotoplanes sp.	
16/09/2015	19:32:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.3	SO242-2_D188_EXP-HOLOCORRAL#8-holothurian sampled with suction pump: container #8	No picture
16/09/2015	19:35:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.3	Photo of ecotox holothurian enclosure corral #8	
16/09/2015	19:36:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.3	Ecotox holothurian enclosure corral #8 moved to allow pushcoring	No picture
16/09/2015	19:38:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.3	Photo of ecotox holothurian enclosure corral #8 sediment before pushcoring	
16/09/2015	19:41:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.3	SO242-2_D198_PUC48	No picture
16/09/2015	19:43:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.4	SO242-2_D198_PUC31	No picture
16/09/2015	19:43:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.4	Photo of ecotox holothurian enclosure corral #8 sediment with pushcores	
16/09/2015	19:48:00	Southern Reference (Outside DEA)	S 07 07.5379 W 088 27.0320	4198.4	Photo of ecotox holothurian enclosure corral #8 sediment after pushcoring	
16/09/2015	20:10:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4193.74	SO242-2_D188_EXP-HOLOCORRAL#7	No picture
16/09/2015	20:13:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4197.3	Benthodytes sp. swimming	No picture

16/09/2015	20:18:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	SO242-2_D188_EXP-HOLOCORRAL#7-holothurian sampled with suction pump: no container	No picture
16/09/2015	20:19:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	Photo of ecotox holothurian enclosure corral #7	
16/09/2015	20:20:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	Ecotox holothurian enclosure corral #7 moved to allow pushcoring	No picture
16/09/2015	20:23:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.28	SO242-2_D198_PUC35	No picture
16/09/2015	20:25:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	SO242-2_D198_PUC73	No picture
16/09/2015	20:29:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	Photo of ecotox holothurian enclosure corral #7 sediment with pushcores	
16/09/2015	20:33:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	---Hydrozoa---------	No picture
16/09/2015	20:33:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4198.3	---Hydrozoa---------	No picture
16/09/2015	20:36:00	Southern Reference (Outside DEA)	S 07 07.5517 W 088 27.0491	4197.96	Photo of ecotox holothurian enclosure corral #7 sediment after pushcoring	
16/09/2015	21:17:00	Southern Reference (Outside DEA)	S 07 07.5215 W 088 27.0396	4196.08	Transit to plastic box marker	No picture
16/09/2015	21:20:00	Southern Reference (Outside DEA)	S 07 07.4908 W 088 27.0154	4194.1	Photo of litter bag	
16/09/2015	21:21:00	Southern Reference (Outside DEA)	S 07 07.4908 W 088 27.0154	4194.4	Photo of litter bag	
16/09/2015	21:23:00	Southern Reference (Outside DEA)	S 07 07.4908 W 088 27.0154	4195.1	Litter bag sampled	No picture
16/09/2015	21:24:00	Southern Reference (Outside DEA)	S 07 07.4908 W 088 27.0154	4194.58	Transit to plastic box marker	No picture

16/09/2015	21:25:00	Southern Reference (Outside DEA)	S 07 07.4908 W 088 27.0154	4193.92	Photo of Scyphozoan	
16/09/2015	21:25:00	Southern Reference (Outside DEA)	S 07 07.4895 W 088 27.0142	4193.8	Photo of Scyphozoan	
16/09/2015	21:32:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4193.9	Photo of litter box	
16/09/2015	21:32:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4193.95833	Litter box adjacent to box core disturbance	No picture
16/09/2015	21:32:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4194.1	Photo of degraded plastic	
16/09/2015	21:32:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4194.16923	Photo of litter box	
16/09/2015	21:33:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4194.2	Photo of litter box and degraded plastic	
16/09/2015	21:40:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4195.25769	Litter box sampled	No picture
16/09/2015	21:44:00	Southern Reference (Outside DEA)	S 07 07.4840 W 088 27.0047	4194.51923	Degraded piece of plastic sampled	No picture
16/09/2015	21:54:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	SO242-2_D188_BFC#2	No picture
16/09/2015	21:58:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	Photo of benthic flux chamber #2 nodule site	
16/09/2015	22:01:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	Benthic flux chamber #2 nodule sampled to port ROV drawer	No picture
16/09/2015	22:04:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	SO242-2_D188_BFC#4	No picture

16/09/2015	22:04:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	Benthic flux chamber #4 recovered	No picture
16/09/2015	22:09:00	Southern Reference (Outside DEA)	S 07 07.5201 W 088 27.0228	4197.8	Benthic flux chamber #2 recovered	No picture
16/09/2015	22:11:00	Southern Reference (Outside DEA)	S 07 07.5216 W 088 27.0230	4173.25	OFF THE BOTTOM	No picture

created 24/09/2015 19:51:20

Dive summary

Kiel 6000 - Dive: 202-1

SO242/2 (RV Sonne)

Date: **17/09/2015**
Observers: **BROWN Alastair, HAECKEL Matthias, JANSSEN Felix, MEVENKAMP Lisa, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 04.979 W 088 28.161**

Dive duration:

Start: **17/09/2015 13:44:57**
At bottom: **17/09/2015 15:30:56**
Leave bottom: **18/09/2015 00:06:09**
End: **18/09/2015 01:36:31**

Explored sites:

Aims of the Dive:

1. Sample DEA Southwest EBS and Plough Track with chamber, profiler, pushcores
2. Deploy inCUBEator chambers for food web studies in old track
3. fill respiration chambers
4. slurp holothurians

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop
5. Senckenberg box

On Elevator:

1. Elevator 1 down (beacon 66): 2 Chamber, 2 Profiler, Amphipod trap
2. Elevator 2 down (beacon 67): 2 CUBEs, 4 respirometers, nodule chamber
3. Elevator 1 up (1 day later): 2 Chamber, 2 Profiler
4. Elevator 2 up (4 days later): 2 CUBEs, 4 respirometers

Dive summary:

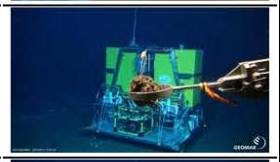
Dive SO242-2_202 (protocol by Tobias Vonnahme)
The target area of the ROV dive 202 was the new DEA Southwest EBS and Plough Track in the DISCOL area. Three nodule respiration chambers were filled with nodules including epizoans. Two profilers (MICP) were replaced three times on different habitats. Two bethic flux (BFC-ROV) were placed in the track. 14 push cores were taken in the white scratches and 2 push cores from the side pile. Four BICs respiration chambers were used; one as a reference and three filled with the Holothurians Synallactes and Paelopatides.

Dive report:

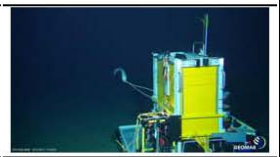
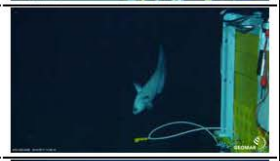
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
17/09/2015	15:30:56	DEA Southwest EBS and Plough Track	S 07 04.9807 W 088 28.1777	4178.92	AT THE BOTTOM	No picture
17/09/2015	15:45:51	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188	BICs respiration chamber 4 (ISCHAM-BICS-#4) on elevator 2 closed (ROV_E-#2)	No picture

17/09/2015	15:49:34	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188	Photo of nodule respiration chamber (ISCHAM-Nodule) 1 -3 on elevator 2 taken	
17/09/2015	15:52:10	DEA Southwest EBS and Plough Track	S 07 04.9680 W 088 28.1715	4188.04	Photo of nodule with sponge for nodule respiration chamber 3 taken (ISCHAM-Nodule-#3-Nodule)	
17/09/2015	15:52:28	DEA Southwest EBS and Plough Track	S 07 04.9677 W 088 28.1715	4188	Photo of nodule with sponge for nodule respiration chamber 3 taken (ISCHAM-Nodule-#3-Nodule)	
17/09/2015	15:53:13	DEA Southwest EBS and Plough Track	S 07 04.9674 W 088 28.1715	4188	Nodule with Xeno found and photo taken, but not sampled	
17/09/2015	15:58:39	DEA Southwest EBS and Plough Track	S 07 04.9668 W 088 28.1738	4188.7	Nodule with sponge collected for nodule respiration chamber with a scoop and cleaned by shaking it	
17/09/2015	15:59:02	DEA Southwest EBS and Plough Track	S 07 04.9667 W 088 28.1737	4188.7	Photo of ISCHAM-Nodule-#3-Nodule with sponge	
17/09/2015	15:59:02	DEA Southwest EBS and Plough Track	S 07 04.9667 W 088 28.1737	4188.7	Photo of ISCHAM-Nodule-#3-Nodule with sponge	
17/09/2015	16:00:10	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1734	4188.6	Photo of ISCHAM-Nodule-#3-Nodule with sponge in the scoop taken	
17/09/2015	16:00:10	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1734	4188.6	Photo of ISCHAM-Nodule-#3-Nodule with spongein the scoop taken	
17/09/2015	16:08:31	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4187.8	ISCHAM-Nodule-#3-Nodule placed in ISCHAM-Nodule-#3	No picture

17/09/2015	16:12:12	DEA Southwest EBS and Plough Track	S 07 04.9681 W 088 28.1739	4187.8	Photo of jellyfish taken, but not sampled	
17/09/2015	16:12:37	DEA Southwest EBS and Plough Track	S 07 04.9678 W 088 28.1744	4187.8	Photo of fish taken, but not sampled	
17/09/2015	16:17:57	DEA Southwest EBS and Plough Track	S 07 04.9604 W 088 28.1753	4188.5	Photo of nodule with sponge and amphipods on it for nodule respiration chamber 2 (ISCHAM-Nodule-#2) taken	
17/09/2015	16:18:26	DEA Southwest EBS and Plough Track	S 07 04.9605 W 088 28.1755	4188.62	Photo of nodule with sponge and amphipods on it for nodule respiration chamber 2 (ISCHAM-Nodule-#2) taken	
17/09/2015	16:18:51	DEA Southwest EBS and Plough Track	S 07 04.9606 W 088 28.1756	4188.7	Photo of nodule with sponge and amphipods on it for nodule respiration chamber 2 (ISCHAM-Nodule-#2) taken	
17/09/2015	16:21:39	DEA Southwest EBS and Plough Track	S 07 04.9610 W 088 28.1752	4188.7	Nodule for nodule rspiration chamber 2 collected with a scoop and photo of the animals on it taken (ISCHAM-Nodule-#2-Nodule)	
17/09/2015	16:23:04	DEA Southwest EBS and Plough Track	S 07 04.9598 W 088 28.1756	4188.7	Photo of animals on ISCHAM-Nodule-#2-Nodule taken	
17/09/2015	16:24:01	DEA Southwest EBS and Plough Track	S 07 04.9598 W 088 28.1756	4188.6	Photo of amphipods on the end of the stalk of the sponge on ISCHAM-Nodule-#2-Nodule taken	
17/09/2015	16:24:15	DEA Southwest EBS and Plough Track	S 07 04.9598 W 088 28.1756	4188.5	Photo of animals on ISCHAM-Nodule-#2-Nodule taken	

17/09/2015	16:27:00	DEA Southwest EBS and Plough Track	S 07 04.9652 W 088 28.1740	4187.5	Photo of ISCHAM-Nodule-#2-Nodule taken	
17/09/2015	16:27:19	DEA Southwest EBS and Plough Track	S 07 04.9661 W 088 28.1735	4187.4	Photo of ISCHAM-Nodule-#2-Nodule taken	
17/09/2015	16:27:34	DEA Southwest EBS and Plough Track	S 07 04.9669 W 088 28.1729	4187.4	Photo of ISCHAM-Nodule-#2-Nodule and ROV_E-#2 in the background taken	
17/09/2015	16:27:34	DEA Southwest EBS and Plough Track	S 07 04.9669 W 088 28.1729	4187.4	Photo of ISCHAM-Nodule-#2-Nodule and ROV_E-#2 in the background taken	
17/09/2015	16:34:42	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4187.8	ISCHAM-Nodule-#2-Nodule placed in nodule respiration ISCHAM-Nodule-#2 and closed after a part of the stalk of the sponge was removed because it didn't fit in the chamber	No picture
17/09/2015	16:38:11	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4187.6	Photo of the DEA Southwest EBS and Plough Track taken	
17/09/2015	16:40:21	DEA Southwest EBS and Plough Track	S 07 04.9717 W 088 28.1698	4187.52	Photo of ISCHAM-Nodule-#1-Nodule with crinoid on it for nodule respiration chamber 1 taken	
17/09/2015	16:41:46	DEA Southwest EBS and Plough Track	S 07 04.9713 W 088 28.1687	4188.3	Photo of ISCHAM-Nodule-#1-Nodule with crinoid on it taken	
17/09/2015	16:42:01	DEA Southwest EBS and Plough Track	S 07 04.9712 W 088 28.1685	4188.5	Photo of ISCHAM-Nodule-#1-Nodule with crinoid on it taken	
17/09/2015	16:43:50	DEA Southwest EBS and	S 07 04.9718 W 088	4188.4	ISCHAM-Nodule-#1-Nodule collected for nodule	No picture

		Plough Track	28.1679		respiration chamber 1 (ISCHAM-Nodule-#1)collected with a scoop	
17/09/2015	16:48:32	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4187.7	Photo of ISCHAM-Nodule-#1-Nodule with crinoid taken, nodule respiration chambers in the background	
17/09/2015	16:56:08	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4187.7	ISCHAM-Nodule-#1-Nodule placed in ISCHAM-Nodule-#1, some arms of the crinoid removed because they sticked out and chamber closed.	No picture
17/09/2015	16:58:57	DEA Southwest EBS and Plough Track	S 07 04.9775 W 088 28.1780	4186.98	Photo of fish taken, but not sampled	
17/09/2015	16:59:09	DEA Southwest EBS and Plough Track	S 07 04.9785 W 088 28.1783	4186.9	Photo of fish taken, but not sampled	
17/09/2015	17:15:44	DEA Southwest EBS and Plough Track	S 07 04.9933 W 088 28.1645	4187	Photo of microsensor profiler 1 (MICP-#1-1) on ROV taken	
17/09/2015	17:16:53	DEA Southwest EBS and Plough Track	S 07 04.9917 W 088 28.1668	4186.9	Photo of microsensor profiler 1 (MICP-#1-1) on ROV taken	
17/09/2015	17:26:37	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	Photo of microsensor profiler 1 (MICP-#1-1) on ROV taken	
17/09/2015	17:29:53	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	putting down MICP-#1-1 in DEA Southwest EBS and Plough Track onto some white patches	No picture
17/09/2015	17:30:47	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	MICP-#1-1 placed on a white patch in the DEA Southwest EBS and Plough Track and photo taken	

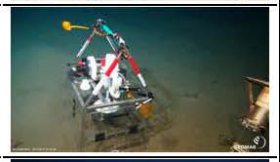
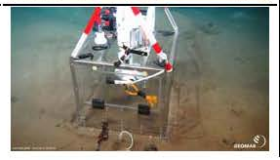
17/09/2015	17:31:11	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	Another photo of MICP-#1-1 taken	
17/09/2015	17:40:00	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	MICP-#1-1 started with a magnetic bar. Light is blinking, motor is turning	No picture
17/09/2015	17:48:02	DEA Southwest EBS and Plough Track	S 07 04.9898 W 088 28.1770	4187.3	Photo of ROV_E-#2 with fish taken	
17/09/2015	17:48:18	DEA Southwest EBS and Plough Track	S 07 04.9898 W 088 28.1770	4187.3	Photo of ROV_E-#2 with fish taken	
17/09/2015	17:58:26	DEA Southwest EBS and Plough Track	S 07 04.9841 W 088 28.1653	4187	Photo of DEA Southwest EBS and Plough Track with dead salps taken	
17/09/2015	17:59:28	DEA Southwest EBS and Plough Track	S 07 04.9829 W 088 28.1659	4187	Photo of DEA Southwest EBS and Plough Track with dead salps taken	
17/09/2015	18:01:33	DEA Southwest EBS and Plough Track	S 07 04.9783 W 088 28.1708	4187	photo of anemone taken, but not sampled	
17/09/2015	18:03:31	DEA Southwest EBS and Plough Track	S 07 04.9743 W 088 28.1744	4187	Photo of Holothurian with feather tail taken, but not sampled	
17/09/2015	18:08:19	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.1	Photo of white scratches in the DEA Southwest EBS and Plough Track for MICP-#2-1 taken	
17/09/2015	18:08:31	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.1	Photo of white scratches in the DEA Southwest EBS and Plough Track for MICP-#2-1 taken	

17/09/2015	18:11:34	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.1	MICP-#2-1 placed in DEA Southwest EBS and Plough Track onto white scratches and pushed down into the sediment	No picture
17/09/2015	18:12:07	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.1	Close up photo of microsensors of MICP-#2-1 taken	
17/09/2015	18:12:25	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.1	Close up photo of microsensors of MICP-#2-1 taken	
17/09/2015	18:18:14	DEA Southwest EBS and Plough Track	S 07 04.9746 W 088 28.1773	4188.16667	MICP-#2-1 activated with magnetic bar, light is blinking, motor is turning, photo taken	
17/09/2015	18:21:13	DEA Southwest EBS and Plough Track	S 07 04.9898 W 088 28.1770	4187.43333	ROV chamber 1 (BFC-ROV-#1) taken off elevator 1 (ROV_E-#1)	No picture
17/09/2015	18:34:21	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4186.8	Photo of white scratches in DEA Southwest EBS and Plough Track for BFC-ROV-#1 placement taken	
17/09/2015	18:34:38	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4186.8	Photo of white scratches for BFC-ROV-#1 placement taken	
17/09/2015	18:39:08	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.2	BFC placed onto the white scatch nex to MICP-#1 -1and photo taken	
17/09/2015	18:44:26	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	Close up photo of BFC-ROV-#1 on the sediment taken	
17/09/2015	18:51:03	DEA Southwest EBS and Plough Track	S 07 04.9960 W 088 28.1754	4187.8	BFC-ROV-#3 taken off elevator 1 (ROV-E-#1)	No picture

17/09/2015	19:00:44	DEA Southwest EBS and Plough Track	S 07 04.9787 W 088 28.1730	4187.08	Photo of DEA Southwest EBS and Plough Track ground for BFC-ROV-#3 taken	
17/09/2015	19:16:06	DEA Southwest EBS and Plough Track	S 07 04.9787 W 088 28.1730	4188.58333	BFC-ROV-#3 placed in the center of the DEA Southwest EBS and Plough Track on white scratches and photo taken	
17/09/2015	19:31:14	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4187.74	Photo of EBS vicinity for phuscoring taken	
17/09/2015	19:35:51	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4189.4	Photo of fish taken, but not sampled	
17/09/2015	19:36:06	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4189.4	Photo of fish taken, but not sampled	
17/09/2015	19:56:42	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4189.5	PUCs taken: PUC-#17, PUC-#65, PUC-#74, PUC-#80, PUC-#76, PUC-#26, PUC-#69, PUC-#63 in right white scratch on the DEA Southwest EBS and Plough Track	No picture
17/09/2015	20:11:36	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4189.6	taken PUCs: PUC-#9, PUC-#52, PUC-#49, PUC-#57, PUC-#33, PUC-#60 left white scratch in the DEA Southwest EBS and Plough Track	No picture
17/09/2015	20:11:55	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1975	4189.6	Photo of PUCs in the DEA Southwest EBS and Plough Track taken	
17/09/2015	20:31:56	DEA Southwest EBS and Plough Track	S 07 04.9519 W 088 28.1998	4189.52	PUCs all pulled out and photo taken afterwards	

17/09/2015	20:32:07	DEA Southwest EBS and Plough Track	S 07 04.9514 W 088 28.2000	4189.4	PUCs all pulled out and photo taken afterwards	
17/09/2015	20:35:41	DEA Southwest EBS and Plough Track	S 07 04.9611 W 088 28.1944	4187.7	Photo of the rim of the DEA Southwest EBS and Plough Track taken	
17/09/2015	20:36:06	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4187.6	Photo of the rim of the DEA Southwest EBS and Plough Track taken	
17/09/2015	20:38:54	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.31667	Photo of the side pile of the DEA Southwest EBS and Plough Track taken	
17/09/2015	20:43:13	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.5	side pile has a quite soft consistency almost reacting flexible	No picture
17/09/2015	20:43:24	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.5	PUC-#18 + PUC-#24 taken in EBS side pile and photo taken	
17/09/2015	20:48:06	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.5	PUC-#18 is very short, thus it was washed out and a new sample was taken, Photo taken	
17/09/2015	20:48:24	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.5	Photo of fish taken, but not sampled	
17/09/2015	20:51:57	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.5	PUC-#18 is again very short, thus it was washed out and a new sample was taken, Photo taken	
17/09/2015	20:55:56	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.1912	4189.26	Photo of PUC area PUC-#18 and PUC-#24 after sampling taken	

17/09/2015	21:01:35	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	Photo of DEA Southwest EBS and Plough Track taken	
17/09/2015	21:02:07	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	Photo of DEA Southwest EBS and Plough Track taken	
17/09/2015	21:02:32	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	Photo of shrimp in DEA Southwest EBS and Plough Track taken	
17/09/2015	21:04:37	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	MICP-#1 replaced, Photo of MICP-#1-2 on the new spot taken	
17/09/2015	21:05:09	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	Close up photo of microsensors of MICP-#1-2 on the new spot	
17/09/2015	21:07:19	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.5	MICP started with magnetic bar, light is blinking motor runs	No picture
17/09/2015	21:13:24	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.5	MICP-#2-2 replaced a few meters to the left and photo taken	
17/09/2015	21:14:59	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.5	MICP-#2-2 started with magnetic bar, light is blinking motor runs	No picture
17/09/2015	21:16:06	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.4	Close up photo of microsensors of MICP-#2-2 on the new spot	
17/09/2015	21:16:23	DEA Southwest EBS and Plough Track	S 07 04.9732 W 088 28.1773	4188.4	Close up photo of microsensors of MICP-#2-2 on the new spot	

17/09/2015	21:36:48	DEA Southwest EBS and Plough Track	S 07 04.9754 W 088 28.1576	4187.55	Photo of plow track taken	
17/09/2015	21:38:50	DEA Southwest EBS and Plough Track	S 07 04.9754 W 088 28.1576	4188.2	Photo of plow track taken	
17/09/2015	21:41:25	DEA Southwest EBS and Plough Track	S 07 04.9754 W 088 28.1576	4188.5	Cube incubation chamber 3 (BFC-CUBE-#3) placed in the old plow track, door closed, pushed into the sediment and photo taken	
17/09/2015	21:48:11	DEA Southwest EBS and Plough Track	S 07 04.9754 W 088 28.1576	4188.6	Photo of BFC-CUBE-#3 and its surrounding taken	
17/09/2015	21:48:29	DEA Southwest EBS and Plough Track	S 07 04.9754 W 088 28.1576	4188.5	Photo of BFC-CUBE-# 3 and its surrounding taken	
17/09/2015	21:58:20	DEA Southwest EBS and Plough Track	S 07 04.9752 W 088 28.1577	4187.9	photo of plow tracks taken	
17/09/2015	21:59:41	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1554	4187.82	photo of plow tracks for placement of cube incubation chamber 3 (BFC-CUBE-#3) taken	
17/09/2015	22:00:06	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1554	4188	photo of plow tracks for placement of cube incubation chamber 3 (BFC-CUBE-#3) taken	
17/09/2015	22:08:13	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1554	4189	BFC-CUBE-#3 placed in the plow track, door closed, cube pressed into the sediment, and photo taken	
17/09/2015	22:08:31	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1554	4189	BFC-CUBE-#3 placed in the plow track and photo taken	

17/09/2015	22:19:17	DEA Southwest EBS and Plough Track	S 07 04.9689 W 088 28.1730	4188.9	The Holothurian Paeleopatides is slurped in with a slurp gun (ISCHAM-BICS-#3-holothurian)	No picture
17/09/2015	22:24:01	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.42	The Holothurian ISCHAM-BICS-#3-holothurian is placed into the BICS respiration chamber 3 (IISCHAM-BICS-#3)	No picture
17/09/2015	22:26:21	DEA Southwest EBS and Plough Track	S 07 04.9712 W 088 28.1671	4188.2	photo of Synallactes + starked sponge taken	
17/09/2015	22:27:31	DEA Southwest EBS and Plough Track	S 07 04.9700 W 088 28.1658	4188.72	photo of Synallactes taken	
17/09/2015	22:27:47	DEA Southwest EBS and Plough Track	S 07 04.9700 W 088 28.1655	4188.84	photo of Synallactes taken, and sluped in with a slurp gun (ISCHAM-BICS-#1-holothurian)	
17/09/2015	22:32:46	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.1	The Holothurian ISCHAM-BICS-#1-holothurian is placed into the BICS respiration chamber 1 (ISCHAM-BICS-#1-holothurian)	No picture
17/09/2015	22:38:23	DEA Southwest EBS and Plough Track	S 07 04.9461 W 088 28.1573	4187.5	Psychronaetes spotted (very long and fat individual), photo taken	
17/09/2015	22:39:22	DEA Southwest EBS and Plough Track	S 07 04.9461 W 088 28.1573	4187.6	Psychronaetes spotted (very long and fat individual), photo taken	
17/09/2015	22:42:32	DEA Southwest EBS and Plough Track	S 07 04.9483 W 088 28.1582	4187.41667	Trial to slurp in the holothurian, but it is very large and blocks the pipe, it is half slurped in and transported (SLURP-#1-holothurian)	No picture
17/09/2015	22:50:12	DEA Southwest EBS and Plough	S 07 04.9715 W 088 28.1738	4186.8	gut content was emptied, but we blow it into the biobox	No picture

		Track				
17/09/2015	22:55:27	DEA Southwest EBS and Plough Track	S 07 05.0055 W 088 28.2051	4188.6	Photo of sponge taken, but not sampled	
17/09/2015	22:57:26	DEA Southwest EBS and Plough Track	S 07 05.0091 W 088 28.2056	4188.92	Photo of Paelopatides (or Synallactes) taken	
17/09/2015	22:58:51	DEA Southwest EBS and Plough Track	S 07 05.0083 W 088 28.2035	4187.98	Holothurian is slurped in (ISCHAM-BICS-#2-holothurian) and ttansported to BICS respiration chamber 2 (ISCHAM-BICS-#2)	No picture
17/09/2015	23:04:16	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.7	ISCHAM-BICS-#2-holothurian is placed in BICS respiration chamber 2	No picture
17/09/2015	23:10:46	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.9	all BICs repiration chamber closed	No picture
17/09/2015	23:11:24	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.9	Photo of all BICs respiration chambers taken	
17/09/2015	23:12:09	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4188.9	Photo of BICS resp. ISCHAM-BICS-#3 taken	
17/09/2015	23:13:49	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4189	Photo of BICS resp. ISCHAM-BICS-#2 taken	
17/09/2015	23:14:07	DEA Southwest EBS and Plough Track	S 07 04.9715 W 088 28.1738	4189	Photo of BICS resp. chamber ISCHAM-BICS-#1 taken	
17/09/2015	23:20:59	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.8	Checking profiler MICP-#1-2, it is moving up, photo taken	

17/09/2015	23:21:11	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.8	Checking MICP-#1-2, it is moving up, photo taken	
17/09/2015	23:28:06	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4187.62	upper HD on for videos of the surrounding	No picture
17/09/2015	23:34:23	DEA Southwest EBS and Plough Track	S 07 04.9466 W 088 28.2020	4188.5	Photo of sea bottom taken	
17/09/2015	23:35:25	DEA Southwest EBS and Plough Track	S 07 04.9482 W 088 28.2002	4188.4	Photo of DEA Southwest EBS and Plough Track with dead holothurians taken	
17/09/2015	23:35:40	DEA Southwest EBS and Plough Track	S 07 04.9487 W 088 28.1997	4188.3	Photo of DEA Southwest EBS and Plough Track with dead holothurians taken	
17/09/2015	23:39:45	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4187.5	back at profiler	No picture
17/09/2015	23:43:37	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.48333	Close up photo of MICP-#1-2 microsensors (MICP) taken	
17/09/2015	23:47:55	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.7	MICP-#1 placed outside the DEA Southwest EBS and Plough Track and activated (MICP-#1-3)	No picture
17/09/2015	23:49:03	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.56	Photo of MICP-#1-3 in position taken	
17/09/2015	23:49:17	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1825	4188.38	Photo of MICP-#1-3 in position taken	

17/09/2015	23:58:19	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4188.36667	Photo of spot with sediment turned around taken and profiler 2 placed on it (MICP-#2-3)	
18/09/2015	00:02:16	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4188.6	Photo of profiler 2 (MICP-#2-3) in position taken	
18/09/2015	00:02:30	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4188.56	Photo of profiler 2 (MICP-#2-3) in position taken	
18/09/2015	00:03:00	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4188.4	Photo of profiler 2 (MICP-#2-3) in position taken	
18/09/2015	00:03:09	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4188.4	Photo of profiler 2 (MICP-#2-3) in position taken	
18/09/2015	00:05:41	DEA Southwest EBS and Plough Track	S 07 04.9562 W 088 28.1918	4185.74	end of dive	No picture
18/09/2015	00:06:09	DEA Southwest EBS and Plough Track	S 07 04.9555 W 088 28.1917	4181.65	OFF THE BOTTOM	No picture
18/09/2015	00:06:36	DEA Southwest EBS and Plough Track	S 07 04.9554 W 088 28.1925	4173.4	upper HD off	No picture

created 24/09/2015 01:17:36

Dive summary

Kiel 6000 - Dive: 205-1

SO242/2 (RV Sonne)

Date: **18/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, HAECKEL Matthias, JANSSEN Felix, LINS Lidia, MUELLER Samuel, SCHULZ Manfred, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.969 W 088 28.182**

Dive duration:

Start: **18/09/2015 15:26:18**
At bottom: **18/09/2015 17:07:57**
Leave bottom: **19/09/2015 00:16:02**
End: **19/09/2015 01:52:02**

Explored sites:

Aims of the Dive:

1. Sample DEA Southwest EBS and Plough Track with chamber, profiler, pushcores
2. slurp holothurians
3. filming of track landscape
4. nodule sampling

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop
5. Senckenberg box

On Elevator:

1. Elevator 1 up: 2 Chamber, 2 Profiler

Dive summary:

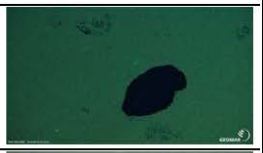
Dive SO242-2_205 (protocol by Samuel Mueller)
During dive SO242-2_D205 to the DEA Southwest EBS and Plough Track of SO242-1 93 Photos (PV) where taken and video footage of undisturbed areas, old pl. tracks as well as reaching and leaving the see floor with the ROV was produced (PV37). The dive started with putting the profilers to a new spot. Profiler two was found fell over, it was placed at a spot with high inclination during dive D202. In general the profiler (MICP) and chamber (BFC) actions worked out well. Seven samples where slurped successfully into slurp containers (SLURP1-7), additionally five samples where put to the biobox using the slurp gun (COLBOX1-5). Highlights oft the biological observations are the photos and films of a crab (PV41), a snail (PV43), and the occurrence of two rare sponges, one shaped cigar-like, hollow and thin walled (PV38) the other one cup-shaped and relatively giant (PV47). Sediment was sampled with push cores (PUC) where five cores where taken off white spots and four off brownish rim of track. No nodules where collected during this dive.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
18/09/2015	17:07:57	DEA Southwest EBS and Plough Track	S 07 04.9688 W 088 28.1918	4171.95714	AT THE BOTTOM	No picture
18/09/2015	17:18:03	DEA Southwest EBS and Plough Track	S 07 04.9699 W 088 28.1844	4187.45	INFO: Lifting profiler 1	No picture
18/09/2015	17:22:22	DEA Southwest EBS and Plough	S 07 04.9531 W 088 28.1958	4186.74286	INFO: White spot for profiler 1 in DEA Southwest EBS and Plough Track found	No picture

		Track				
18/09/2015	17:25:56	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.6	SO242-2_D205_PV1: Decapode crab: photo taken	
18/09/2015	17:28:36	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.5	INFO: Deploying profiler 1 on white area in DEA Southwest EBS and Plough Track	No picture
18/09/2015	17:30:21	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.6	SO242-2_D205_PV2: Close up photo of profiler 1 microsensors	
18/09/2015	17:30:48	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.6	SO242-2_D205_PV3: Close up photo of microsensors of Prof 1	
18/09/2015	17:32:27	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.6	SO242-2_D205_MICP1-1 Activating Profiler 1 Profiler 1 is blinking and wheel is turning	No picture
18/09/2015	17:35:34	DEA Southwest EBS and Plough Track	S 07 04.9552 W 088 28.1952	4187	SO242-2_D205_PV4: Profiler 2 reached, Profiler is laying on the side	
18/09/2015	17:35:50	DEA Southwest EBS and Plough Track	S 07 04.9554 W 088 28.1951	4187.14286	SO242-2_D205_PV5: Profiler 2 reached, Profiler is laying on the side	
18/09/2015	17:38:25	DEA Southwest EBS and Plough Track	S 07 04.9564 W 088 28.1936	4188.37143	INFO: Lifting profiler 2 and Moving into the DEA Southwest EBS and Plough Track to find brown area for profiler 2	No picture
18/09/2015	17:41:32	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.26667	SO242-2_D205_PV6: Photo of brown area for profiler 2 taken	
18/09/2015	17:43:26	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.4	INFO: Profiler 2 deployed in the DEA Southwest EBS and Plough Track on brown area next to Prof 1	No picture
18/09/2015	17:46:18	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.4	SO242-2_D205_PV7: Close up photo of microsensors of profiler 2 in position	

18/09/2015	17:47:27	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.4	SO242-2_D205_MICP2-1: Activating profiler 2, light is blinking and wheel is turning, Profiler 2 is activated	No picture
18/09/2015	17:52:13	DEA Southwest EBS and Plough Track	S 07 04.9631 W 088 28.1876	4187.56667	INFO: checking if chamber 1 looks okay	No picture
18/09/2015	17:52:34	DEA Southwest EBS and Plough Track	S 07 04.9635 W 088 28.1874	4187.7	OBS BIO: salps	No picture
18/09/2015	17:57:59	DEA Southwest EBS and Plough Track	S 07 04.9629 W 088 28.1944	4187.41429	SO242-2_D205_PV8: shrimp	
18/09/2015	17:58:17	DEA Southwest EBS and Plough Track	S 07 04.9629 W 088 28.1952	4187.5	SO242-2_D205_PV9: shrimp	
18/09/2015	18:00:36	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2002	4187.6	SO242-2_D205_PV10: Palaeopatides and scotoplanes	
18/09/2015	18:01:05	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2002	4187.7	SO242-2_D205_PV11: Close up of scotoplanes	
18/09/2015	18:01:15	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2002	4187.82222	SO242-2_D205_PV12: close up of plaeopatides	
18/09/2015	18:01:29	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2002	4187.9	SO242-2_D205_PV13: Palaeopatides and scotoplanes	
18/09/2015	18:04:11	DEA Southwest EBS and Plough Track	S 07 04.9647 W 088 28.2014	4188.6	SO242-2_D205_SLURP0: first holothurian slurped, scotoplanes	No picture
18/09/2015	18:04:54	DEA Southwest EBS and Plough Track	S 07 04.9647 W 088 28.2014	4188.6	INFO: paeleopatides is hunted	No picture
18/09/2015	18:09:00	DEA Southwest EBS and Plough Track	S 07 04.9647 W 088 28.2014	4188.6	INFO: paeleopatides slurped	No picture

18/09/2015	18:09:42	DEA Southwest EBS and Plough Track	S 07 04.9647 W 088 28.2014	4188.4	SO242-2_D205_COLBOX1 Paeleopatides in the biobox	No picture
18/09/2015	18:09:58	DEA Southwest EBS and Plough Track	S 07 04.9647 W 088 28.2021	4188.3	OBS BIO: Paleopatides	No picture
18/09/2015	18:10:48	DEA Southwest EBS and Plough Track	S 07 04.9648 W 088 28.2046	4187.94286	OBS BIO: Ophiuroid	No picture
18/09/2015	18:11:06	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2064	4187.8	OBS BIO: salp	No picture
18/09/2015	18:11:13	DEA Southwest EBS and Plough Track	S 07 04.9649 W 088 28.2071	4187.75	OBS BIO: Sponge	No picture
18/09/2015	18:12:21	DEA Southwest EBS and Plough Track	S 07 04.9653 W 088 28.2132	4187.7	SO242-2_D205_PV14: Probeebei	
18/09/2015	18:15:54	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2303	4188.33333	SO242-2_D205_PV15: Holothurian	
18/09/2015	18:16:25	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2303	4188.6	SO242-2_D205_PV16: Holothurian	
18/09/2015	18:18:49	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2303	4188.7	SO242-2_D205_SLURP1: Amperima in slurpgun container 1	No picture
18/09/2015	18:20:06	DEA Southwest EBS and Plough Track	S 07 04.9634 W 088 28.2335	4188.5	SO242-2_D205_PV17: Ipnops or Probeebei	
18/09/2015	18:21:09	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2349	4188.6	SO242-2_D205_PV18: Scotoplanes with crab	
18/09/2015	18:21:49	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2349	4188.76667	SO242-2_D205_PV19: scotoplanes	

18/09/2015	18:24:39	DEA Southwest EBS and Plough Track	S 07 04.9637 W 088 28.2349	4188.48333	SO242-2_D205_SLURP2: scotoplanes pieces go into the slurpgun container 2	No picture
18/09/2015	18:27:33	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.2379	4188.7	SO242-2_D205_PV20: Psychropotidae with slurpgun as transportaion tool to put it in biobox	
18/09/2015	18:34:00	DEA Southwest EBS and Plough Track	S 07 04.9613 W 088 28.2380	4188.8	SO242-2_D205_COLBOX2 Psychropotes in the biobox	No picture
18/09/2015	18:36:43	DEA Southwest EBS and Plough Track	S 07 04.9629 W 088 28.2400	4188.5	OBS BIO: Ophiuroid	No picture
18/09/2015	18:37:42	DEA Southwest EBS and Plough Track	S 07 04.9617 W 088 28.2418	4188.4	OBS BIO: Scotoplanes	No picture
18/09/2015	18:37:56	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.2420	4188.4	OBS BIO: Probeebei	No picture
18/09/2015	18:37:59	DEA Southwest EBS and Plough Track	S 07 04.9615 W 088 28.2420	4188.4	OBS BIO: salp	No picture
18/09/2015	18:38:27	DEA Southwest EBS and Plough Track	S 07 04.9611 W 088 28.2421	4188.5	SO242-2_D205_PV21: scotoplanes	
18/09/2015	18:38:44	DEA Southwest EBS and Plough Track	S 07 04.9611 W 088 28.2420	4188.5	SO242-2_D205_PV22: scotoplanes close up	
18/09/2015	18:40:13	DEA Southwest EBS and Plough Track	S 07 04.9613 W 088 28.2427	4188.7	SO242-2_D205_SLURP3: scotoplanes slurped in slurpgun container number 3	No picture
18/09/2015	18:42:37	DEA Southwest EBS and Plough Track	S 07 04.9586 W 088 28.2433	4188.7	OBS BIO: Probeebei	No picture
18/09/2015	18:42:59	DEA Southwest EBS and Plough Track	S 07 04.9568 W 088 28.2432	4188.6	OBS BIO: salp	No picture
18/09/2015	18:43:24	DEA Southwest EBS and Plough Track	S 07 04.9544 W 088 28.2431	4188.7	OBS BIO: Probeebei	No picture

18/09/2015	18:45:29	DEA Southwest EBS and Plough Track	S 07 04.9485 W 088 28.2434	4188.7	SO242-2_D205_PV23: Stalk Cnidaria s	
18/09/2015	18:46:22	DEA Southwest EBS and Plough Track	S 07 04.9477 W 088 28.2438	4188.62857	SO242-2_D205_PV24: Stalk Cnidaria s	
18/09/2015	18:46:44	DEA Southwest EBS and Plough Track	S 07 04.9475 W 088 28.2439	4188.6	SO242-2_D205_PV25: Close up of Stalk Cnidaria s	
18/09/2015	18:46:59	DEA Southwest EBS and Plough Track	S 07 04.9474 W 088 28.2441	4188.6	SO242-2_D205_PV26: Close up of Stalk Cnidaria s	
18/09/2015	18:47:37	DEA Southwest EBS and Plough Track	S 07 04.9476 W 088 28.2435	4188.6	OBS BIO: Asteroid	No picture
18/09/2015	18:49:57	DEA Southwest EBS and Plough Track	S 07 04.9490 W 088 28.2397	4188.7	SO242-2_D205_PV27: two shrimp	
18/09/2015	18:50:26	DEA Southwest EBS and Plough Track	S 07 04.9495 W 088 28.2388	4188.7	SO242-2_D205_PV28: close up shrimp	
18/09/2015	18:50:45	DEA Southwest EBS and Plough Track	S 07 04.9495 W 088 28.2383	4188.7	SO242-2_D205_PV29: close up shrimp	
18/09/2015	18:53:41	DEA Southwest EBS and Plough Track	S 07 04.9535 W 088 28.2258	4188.6	OBS BIO: Holothurian	
18/09/2015	18:55:15	DEA Southwest EBS and Plough Track	S 07 04.9537 W 088 28.2273	4188.5	SO242-2_D205_COLBOX3 scotoplanes in the biobox	No picture
18/09/2015	18:57:29	DEA Southwest EBS and Plough Track	S 07 04.9544 W 088 28.2246	4188.55714	SO242-2_D205_SLURP4 small scotoplanes in slurpgun chamber 4	No picture

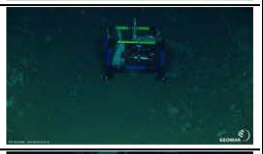
18/09/2015	18:57:37	DEA Southwest EBS and Plough Track	S 07 04.9544 W 088 28.2243	4188.5	OBS BIO: Ophiuroid	No picture
18/09/2015	18:57:40	DEA Southwest EBS and Plough Track	S 07 04.9545 W 088 28.2242	4188.5	OBS BIO: Stalk	No picture
18/09/2015	18:58:05	DEA Southwest EBS and Plough Track	S 07 04.9542 W 088 28.2244	4188.5	OBS BIO: Ophiuroid	No picture
18/09/2015	18:58:42	DEA Southwest EBS and Plough Track	S 07 04.9544 W 088 28.2233	4188.5	SO242-2_D205_PV30: two Holothurian	
18/09/2015	18:58:59	DEA Southwest EBS and Plough Track	S 07 04.9546 W 088 28.2229	4188.5	SO242-2_D205_PV30: two Holothurian close up	
18/09/2015	19:02:12	DEA Southwest EBS and Plough Track	S 07 04.9542 W 088 28.2207	4188.6	SO242-2_D205_PV31: Psychronaetes when tried to be slurped	
18/09/2015	19:05:34	DEA Southwest EBS and Plough Track	S 07 04.9549 W 088 28.2205	4188.6	SO242-2_D205_COLBOX4 Psychronaetes in the biobox	No picture
18/09/2015	19:10:31	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.2178	4188.6	SO242-2_D205_SLURP5 munnopsid in the slurpgun chamber 5	No picture
18/09/2015	19:11:42	DEA Southwest EBS and Plough Track	S 07 04.9532 W 088 28.2185	4188.7	SO242-2_D205_PV32: fecal matter	
18/09/2015	19:12:48	DEA Southwest EBS and Plough Track	S 07 04.9537 W 088 28.2169	4188.7	OBS BIO: Sponge	No picture
18/09/2015	19:12:52	DEA Southwest EBS and Plough Track	S 07 04.9538 W 088 28.2167	4188.7	OBS BIO: Ophiuroid	No picture
18/09/2015	19:13:22	DEA Southwest EBS and Plough Track	S 07 04.9546 W 088 28.2155	4188.7	OBS BIO: salp	No picture
18/09/2015	19:13:36	DEA Southwest EBS and	S 07 04.9548 W 088	4188.7	OBS BIO: Stalk	No picture

		Plough Track	28.2149			
18/09/2015	19:13:53	DEA Southwest EBS and Plough Track	S 07 04.9551 W 088 28.2139	4188.7	OBS BIO: Sponge	No picture
18/09/2015	19:14:23	DEA Southwest EBS and Plough Track	S 07 04.9560 W 088 28.2120	4188.7	SO242-2_D205_PV33: Ophiuroid	
18/09/2015	19:15:07	DEA Southwest EBS and Plough Track	S 07 04.9561 W 088 28.2087	4188.8	OBS BIO: salp	No picture
18/09/2015	19:15:54	DEA Southwest EBS and Plough Track	S 07 04.9552 W 088 28.2062	4188.8	OBS BIO: Fish	No picture
18/09/2015	19:16:25	DEA Southwest EBS and Plough Track	S 07 04.9544 W 088 28.2056	4188.8	OBS BIO: Sponge	No picture
18/09/2015	19:16:35	DEA Southwest EBS and Plough Track	S 07 04.9541 W 088 28.2055	4188.8	OBS BIO: Isopoda	No picture
18/09/2015	19:18:28	DEA Southwest EBS and Plough Track	S 07 04.9503 W 088 28.2064	4188.8	SO242-2_D205_PV34: Paleopatides	
18/09/2015	19:18:39	DEA Southwest EBS and Plough Track	S 07 04.9500 W 088 28.2063	4188.8	SO242-2_D205_PV35: Paleopatides	
18/09/2015	19:21:31	DEA Southwest EBS and Plough Track	S 07 04.9470 W 088 28.2076	4188.5	SO242-2_D205_COLBOX5 palaeopatides in the biobox	No picture
18/09/2015	19:24:15	DEA Southwest EBS and Plough Track	S 07 04.9479 W 088 28.2058	4188.5	SO242-2_D205_PV36: Video footage of tracks. Antje and Manfdred in, for footage of disturbed and undisturbed area	No picture
18/09/2015	19:27:33	DEA Southwest EBS and Plough Track	S 07 04.9296 W 088 28.2195	4186.9	INFO: fly m diosturbed track to film	No picture
18/09/2015	19:32:29	DEA Southwest EBS and Plough Track	S 07 04.9107 W 088 28.2410	4187.25714	INFO: turned different ways over disturbedn track	No picture

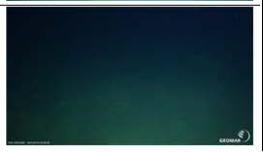
18/09/2015	19:37:13	DEA Southwest EBS and Plough Track	S 07 04.9250 W 088 28.2157	4180.04286	INFO: start dive down to fil arrival at seafloor	No picture
18/09/2015	19:37:23	DEA Southwest EBS and Plough Track	S 07 04.9259 W 088 28.2155	4180.25	INFO: go for undisturbed track	No picture
18/09/2015	19:40:04	DEA Southwest EBS and Plough Track	S 07 04.9384 W 088 28.2050	4188.375	INFO: film undisturbed	No picture
18/09/2015	19:42:32	DEA Southwest EBS and Plough Track	S 07 04.9440 W 088 28.1988	4188.6	INFO: film nodule with sponge	No picture
18/09/2015	19:43:00	DEA Southwest EBS and Plough Track	S 07 04.9444 W 088 28.1981	4188.6	OBS BIO: red seacucumber	No picture
18/09/2015	19:49:03	DEA Southwest EBS and Plough Track	S 07 04.9524 W 088 28.1919	4188.5	INFO: move backwards and up to leave seafloor behind	No picture
18/09/2015	19:50:48	DEA Southwest EBS and Plough Track	S 07 04.9550 W 088 28.1904	4188.5	INFO: end of undistrubed, now to old plough track	No picture
18/09/2015	19:53:02	DEA Southwest EBS and Plough Track	S 07 04.9584 W 088 28.1885	4188.5	SO242-2_D205_PV37: photo of werid sponge and isopod	
18/09/2015	19:54:03	DEA Southwest EBS and Plough Track	S 07 04.9599 W 088 28.1875	4188.5	SO242-2_D205_PV38: photo of werid sponge and isopod close up isopod	
18/09/2015	19:54:16	DEA Southwest EBS and Plough Track	S 07 04.9599 W 088 28.1875	4188.5	SO242-2_D205_PV39: photo of werid sponge close up of sponge top	
18/09/2015	19:54:57	DEA Southwest EBS and Plough Track	S 07 04.9609 W 088 28.1868	4188.5	SO242-2_D205_PV40: close up of crab	
18/09/2015	19:54:59	DEA Southwest EBS and Plough Track	S 07 04.9610 W 088 28.1868	4188.5	SO242-2_D205_PV41: film of crab	No picture

18/09/2015	20:00:41	DEA Southwest EBS and Plough Track	S 07 04.9720 W 088 28.1809	4188.4	SO242-2_D205_PV42: Snail	
18/09/2015	20:00:48	DEA Southwest EBS and Plough Track	S 07 04.9722 W 088 28.1807	4188.4	SO242-2_D205_PV43: Video of snail	No picture
18/09/2015	20:01:21	DEA Southwest EBS and Plough Track	S 07 04.9734 W 088 28.1797	4188.37778	SO242-2_D205_PV44: Snail close up	
18/09/2015	20:01:53	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1787	4188.3	SO242-2_D205_PV45: Snail close up	
18/09/2015	20:04:09	DEA Southwest EBS and Plough Track	S 07 04.9782 W 088 28.1736	4188.3	SO242-2_D205_PV46: sponge giant on weird stalk	
18/09/2015	20:04:22	DEA Southwest EBS and Plough Track	S 07 04.9782 W 088 28.1736	4188.3	SO242-2_D205_PV47: sponge giant on weird stalk	
18/09/2015	20:05:48	DEA Southwest EBS and Plough Track	S 07 04.9830 W 088 28.1714	4188.3	INFO: go to old track	No picture
18/09/2015	20:08:00	DEA Southwest EBS and Plough Track	S 07 04.9964 W 088 28.1770	4188.5	INFO: disturbed track , some anilmals on the side, excellent filming	No picture
18/09/2015	20:09:03	DEA Southwest EBS and Plough Track	S 07 04.9990 W 088 28.1795	4188.6	SO242-2_D205_PV48: zooarcid fish	
18/09/2015	20:15:24	DEA Southwest EBS and Plough Track	S 07 04.9772 W 088 28.1889	4188	SO242-2_D205_PV49: whitish concretions at the seafloor - sediment?	
18/09/2015	20:16:03	DEA Southwest EBS and Plough Track	S 07 04.9773 W 088 28.1891	4188	SO242-2_D205_PV50: stalk with ophiuroid	

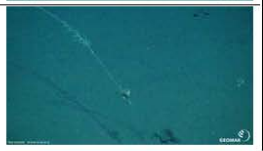
18/09/2015	20:16:23	DEA Southwest EBS and Plough Track	S 07 04.9770 W 088 28.1891	4188	SO242-2_D205_PV51: stalk with ophiuroid	
18/09/2015	20:16:46	DEA Southwest EBS and Plough Track	S 07 04.9757 W 088 28.1891	4188	SO242-2_D205_PV52: stalk with ophiuroid overview	
18/09/2015	20:24:32	DEA Southwest EBS and Plough Track	S 07 04.9543 W 088 28.1985	4188.28571	INFO: taking 3 pushcores for meiofauna on white scratch (action 7), selecting a spot very close to profiler 1	No picture
18/09/2015	20:31:57	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.5	SO242-2_D205_PV53: sediment patch with PCs	
18/09/2015	20:37:26	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.6	SO242-2_D205_PUC21, SO242-2_D205_PUC51, SO242-2_D205_PUC71	No picture
18/09/2015	20:38:27	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.45333	SO242-2_D205_PV54: sediment patch after pusch coring	
18/09/2015	20:38:44	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.4	SO242-2_D205_PV55: core sampling region of SO242-2_D205_MICP1-1	
18/09/2015	20:39:45	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.15625	SO242-2_D205_PV56: close up of sensors of SO242-2_D205_MICP1-1	
18/09/2015	20:40:11	DEA Southwest EBS and Plough Track	S 07 04.9529 W 088 28.1983	4189.06667	SO242-2_D205_PV57: SO242-2_D205_MICP1-1 and SO242-2_D205_MICP2-1 overview	
18/09/2015	20:42:31	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.5	SO242-2_D205_PV58: Sensors of SO242-2_D205_MICP2-1	
18/09/2015	20:42:53	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.6	SO242-2_D205_PV59: Sensors of SO242-2_D205_MICP2-1	

18/09/2015	20:47:17	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188	INFO: picking up profiler 2 to move to white pile to the side of the track.	No picture
18/09/2015	20:47:25	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.1	OBS BIO: Fish	No picture
18/09/2015	20:49:32	DEA Southwest EBS and Plough Track	S 07 04.9536 W 088 28.1950	4188.3	SO242-2_D205_MICP1-1 and SO242-2_D205_MICP2-1: end of meassurement. both profilers blinking right now - both programs finished (prof. 2 since 15, prof. 1 since 5 min)	No picture
18/09/2015	21:08:49	DEA Southwest EBS and Plough Track	S 07 04.9628 W 088 28.1871	4188.37143	SO242-2_D205_MICP2-2: Sediment patch of measurement	
18/09/2015	21:12:34	DEA Southwest EBS and Plough Track	S 07 04.9628 W 088 28.1871	4188.6	SO242-2_D205_MICP2-2: profiler started with magnet stick	No picture
18/09/2015	21:13:32	DEA Southwest EBS and Plough Track	S 07 04.9628 W 088 28.1871	4188.6	SO242-2_D205_PV60: SO242-2_D205_MICP2-2 at position and started	
18/09/2015	21:13:54	DEA Southwest EBS and Plough Track	S 07 04.9628 W 088 28.1871	4188.6	SO242-2_D205_PV61: SO242-2_D205_MICP2-2 in foreground and SO242-2_D202_BFC3 In background	
18/09/2015	21:19:53	DEA Southwest EBS and Plough Track	S 07 04.9738 W 088 28.1774	4187.6	SO242-2_D205_PV62: moving a bit closer to SO242-2_D202_BFC3 to judge overlying water height	
18/09/2015	21:21:16	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4188.1	SO242-2_D205_PV63: zooming in more on SO242-2_D202_BFC3	
18/09/2015	21:21:34	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4188.2	SO242-2_D205_PV64: SO242-2_D202_BFC3 green ring flush with sediment surface, i.e., 12.5 cm overlying water height	
18/09/2015	21:23:58	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4188.5	INFO: landing to take PCs at the brownish rim of the track where more sediment resettled after the EBS deployment	No picture

18/09/2015	21:33:51	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV65: Push cores placed in sediment SO242-2_D205_PUC35 was not working, retrived in bad state before picture	
18/09/2015	21:34:09	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC48	No picture
18/09/2015	21:35:04	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC68	No picture
18/09/2015	21:36:00	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC36	No picture
18/09/2015	21:37:17	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC31	No picture
18/09/2015	21:39:07	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV66: photo of sampled patch	
18/09/2015	21:41:38	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4188.61667	INFO: selecting nearby patch for sampling of whitisch pile NE side of track	No picture
18/09/2015	21:48:16	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV67: patch for push coring	
18/09/2015	21:51:56	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	INFO: ofop crashed for 5 min.	No picture
18/09/2015	21:52:11	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV68: Pushcoring at a pile of whitish sediment on the NE side of the track close to chamber 3	
18/09/2015	21:53:26	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC59	No picture
18/09/2015	21:53:29	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PUC55	No picture

18/09/2015	21:55:30	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV69: SO242-2_D202_BFC3 syringes	
18/09/2015	21:55:58	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.3	SO242-2_D205_PV70: SO242-2_D202_BFC3 penetratin	
18/09/2015	21:56:36	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4189.11429	SO242-2_D205_PV71: crab feeding on salp carcass	
18/09/2015	21:57:15	DEA Southwest EBS and Plough Track	S 07 04.9749 W 088 28.1745	4188.42857	INFO: beacon 67 on elevator does not seem to work properly	No picture
18/09/2015	22:06:36	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1958	4188.8	INFO: SO242-2_D205_MICP1-1 picked up	No picture
18/09/2015	22:20:22	DEA Southwest EBS and Plough Track	S 07 04.9911 W 088 28.1764	4188.8	INFO: SO242-2_D205_MICP1-1 fixed to elevator	No picture
18/09/2015	22:31:22	DEA Southwest EBS and Plough Track	S 07 04.9660 W 088 28.1858	4188.7	INFO: SO242-2_D202_BFC1 picked up	No picture
18/09/2015	22:39:51	DEA Southwest EBS and Plough Track	S 07 04.9911 W 088 28.1764	4188.9	INFO: SO242-2_D202_BFC1 fixed to elevator	No picture
18/09/2015	22:48:46	DEA Southwest EBS and Plough Track	S 07 04.9774 W 088 28.1728	4188.6125	INFO: SO242-2_D202_BFC3 picked up	No picture
18/09/2015	22:58:36	DEA Southwest EBS and Plough Track	S 07 04.9911 W 088 28.1764	4188.8	INFO: SO242-2_D202_BFC3 fixed to elevator	No picture
18/09/2015	23:07:53	DEA Southwest EBS and Plough Track	S 07 04.9906 W 088 28.1716	4187.9	SO242-2_D205_PV72: old Pl. track	
18/09/2015	23:08:50	DEA Southwest EBS and Plough Track	S 07 04.9893 W 088 28.1689	4188	SO242-2_D205_PV73: old Pl. track	

18/09/2015	23:09:24	DEA Southwest EBS and Plough Track	S 07 04.9881 W 088 28.1668	4188.1	SO242-2_D205_PV74: old Pl. track	
18/09/2015	23:10:50	DEA Southwest EBS and Plough Track	S 07 04.9854 W 088 28.1643	4188.3	SO242-2_D205_PV75: old Pl. track	
18/09/2015	23:22:09	DEA Southwest EBS and Plough Track	S 07 04.9681 W 088 28.1505	4187.8	SO242-2_D205_PV76: old Pl. track	
18/09/2015	23:22:25	DEA Southwest EBS and Plough Track	S 07 04.9680 W 088 28.1501	4187.8	SO242-2_D205_PV77: old Pl. track	
18/09/2015	23:23:21	DEA Southwest EBS and Plough Track	S 07 04.9672 W 088 28.1491	4188	SO242-2_D205_PV78: old Pl. track	
18/09/2015	23:23:48	DEA Southwest EBS and Plough Track	S 07 04.9661 W 088 28.1478	4187.9	SO242-2_D205_PV79: old Pl. track	
18/09/2015	23:25:44	DEA Southwest EBS and Plough Track	S 07 04.9599 W 088 28.1444	4188	SO242-2_D205_PV80: old Pl. track	
18/09/2015	23:28:05	DEA Southwest EBS and Plough Track	S 07 04.9534 W 088 28.1418	4187.9	SO242-2_D205_PV81: old Pl. track	
18/09/2015	23:28:29	DEA Southwest EBS and Plough Track	S 07 04.9523 W 088 28.1408	4187.825	SO242-2_D205_PV82: old Pl. track	
18/09/2015	23:29:27	DEA Southwest EBS and Plough Track	S 07 04.9501 W 088 28.1383	4187.7	SO242-2_D205_PV83: old Pl. track	

18/09/2015	23:30:56	DEA Southwest EBS and Plough Track	S 07 04.9456 W 088 28.1338	4187.375	SO242-2_D205_PV84: old Pl. track	
18/09/2015	23:32:10	DEA Southwest EBS and Plough Track	S 07 04.9420 W 088 28.1299	4187.08571	SO242-2_D205_PV85: old Pl. track	
18/09/2015	23:34:52	DEA Southwest EBS and Plough Track	S 07 04.9375 W 088 28.1263	4186.8	SO242-2_D205_PV86: old Pl. track	
18/09/2015	23:36:09	DEA Southwest EBS and Plough Track	S 07 04.9378 W 088 28.1283	4186.5	SO242-2_D205_PV87: old Pl. track	
18/09/2015	23:46:27	DEA Southwest EBS and Plough Track	S 07 04.9501 W 088 28.1733	4188.3	trying to slurp isopod	No picture
18/09/2015	23:49:53	DEA Southwest EBS and Plough Track	S 07 04.9551 W 088 28.1724	4189	SO242-2_D205_SLURP6: isopod into slurpe container 6	No picture
18/09/2015	23:58:21	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.1	SO242-2_D205_PV88: isopod	
18/09/2015	23:59:21	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.1	SO242-2_D205_PV89: isopod	
18/09/2015	23:59:39	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.1	SO242-2_D205_PV90: isopod	
18/09/2015	23:59:57	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.1	SO242-2_D205_PV91: isopod	
19/09/2015	00:00:16	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.1	SO242-2_D205_PV92: isopod	

19/09/2015	00:00:40	DEA Southwest EBS and Plough Track	S 07 04.9745 W 088 28.1823	4189.2	SO242-2_D205_PV93: isopod	
19/09/2015	00:04:02	DEA Southwest EBS and Plough Track	S 07 04.9759 W 088 28.1826	4189.1	SO242-2_D205_SLURP7: isopod into slurpe container 7	No picture
19/09/2015	00:09:18	DEA Southwest EBS and Plough Track	S 07 04.9628 W 088 28.1871	4188.6	INFO: Profiler 2 put onto porch	No picture
19/09/2015	00:16:02	DEA Southwest EBS and Plough Track	S 07 04.9569 W 088 28.1856	4185.41429	OFF THE BOTTOM	No picture
19/09/2015	00:16:44	DEA Southwest EBS and Plough Track	S 07 04.9531 W 088 28.1849	4176.37143	ON DECK	No picture

created 28/09/2015 00:07:45

Dive summary

Kiel 6000 - Dive: 211-1

SO242/2 (RV Sonne)

Date: **20/09/2015**
Observers: **BOETIUS Antje, BOHSUNG Seinab, HAECKEL Matthias, JANSSEN Felix, LINS Lidia, MEVENKAMP Lisa, PAUL Sophie, STRATMANN Tanja, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.9529 W 088 28.1983**

Dive duration:

Start: **20/09/2015 13:42:26**
At bottom: **20/09/2015 15:14:36**
Leave bottom: **20/09/2015 22:02:18**
End: **20/09/2015 23:40:49**

Explored sites:

Aims of the Dive:

1. Sample DEA Southwest EBS and Plough Track with chamber, profiler, pushcores
2. slurp holothurians
3. filming of track landscape

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop
5. Senckenberg box

On Elevator:

1. Elevator 1 down: 3 Chamber, 1 Profiler

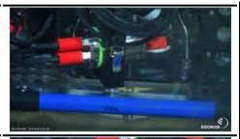
Dive summary:

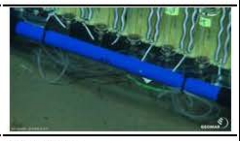
Dive SO242-2_211 (protocol by Sophie Paul)
This dive was carried out in an EBS plough track in the south-west DEA area. The dive aimed to place one profiler in the DEA Southwest EBS and Plough Track, to sample the DEA Southwest EBS and Plough Track with chambers, to take push cores, and to sample fauna. Profiler 1 was placed on a white patch in the DEA Southwest EBS and Plough Track. Afterwards, the three chambers were placed in the DEA Southwest EBS and Plough Track, aimed at white patches as well. Penetration depth was sufficient for all three chambers. Two push cores were taken next to the DEA Southwest EBS and Plough Track and 14 push cores at the rim of the DEA Southwest EBS and Plough Track. During the dive, various animals were sampled: two sponges were placed in the biobox and three isopods, two peniagones and one holothurian were slurped into the ROV carrousel. The KIPS was tested during this dive in order to see if it will work for the planned plume experiment. Unfortunately, only two bottle could be filled successfully. During closure of bottle B the signal was lost.

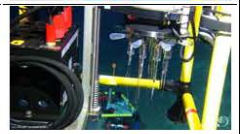
Dive report:

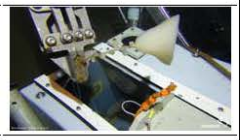
Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
20/09/2015	15:14:36	DEA Southwest EBS and Plough Track	S 07 04.9960 W 088 28.1932	4170	AT THE BOTTOM	No picture
20/09/2015	15:31:16	DEA Southwest EBS and Plough Track	S 07 04.9836 W 088 28.1659	4187.1	picture of track (white spot) where profiler 1 will be placed	
20/09/2015	15:31:37	DEA Southwest EBS and Plough Track	S 07 04.9832 W 088 28.1657	4187.1	picture of track (white spot) where profiler 1 will be placed	
20/09/2015	15:35:19	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.67143	photo of shrimp	

20/09/2015	15:36:14	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.5	position of profiler1 placement gets slightly shifted forward in the track	No picture
20/09/2015	15:36:50	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.32857	difference between bottom of track and the side ripple is almost one meter	No picture
20/09/2015	15:38:09	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.2	photo of Profiler 1 placed on sediment (SO242-2_D211_MICP1)	
20/09/2015	15:39:41	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.1	photo of profiler 1 zoomed in on sensors	
20/09/2015	15:43:15	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.3	wheel was turning. profiler 1-1 D211 started	No picture
20/09/2015	15:43:49	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4188.22857	photo of profiler 1	
20/09/2015	15:44:28	DEA Southwest EBS and Plough Track	S 07 04.9858 W 088 28.1622	4187.85714	photo of profiler 1	
20/09/2015	15:58:09	DEA Southwest EBS and Plough Track	S 07 04.9892 W 088 28.1605	4187.08571	photo of starfish eating salp	
20/09/2015	15:58:21	DEA Southwest EBS and Plough Track	S 07 04.9893 W 088 28.1603	4187.17143	photo of starfish eating salp	
20/09/2015	16:00:24	DEA Southwest EBS and Plough Track	S 07 04.9902 W 088 28.1580	4187.7	photo of fish	
20/09/2015	16:00:52	DEA Southwest EBS and Plough Track	S 07 04.9905 W 088 28.1576	4187.7	photo of fish	
20/09/2015	16:03:41	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4188.1	photo of track, sediment patch where chamber 1 will be placed	

20/09/2015	16:07:54	DEA Southwest EBS and Plough Track	S 07 04.9904 W 088 28.1580	4188.2	photo of chamber 1 (SO242-2_D211_BFC1), zoom on rings/penetration depth, white ring is visible (10cm?)	
20/09/2015	16:08:12	DEA Southwest EBS and Plough Track	S 07 04.9904 W 088 28.1583	4188.03333	photo, zoom on rings/penetration depth, white ring is visible (10cm)	
20/09/2015	16:22:29	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4187.25	photo of sediment spot for chamber 2	
20/09/2015	16:28:30	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4188.3	photo of chamber 2 (SO242-2_D211_BFC2), white ring is clearly visible and a tiny bit of the underlaying green ring can be seen too	No picture
20/09/2015	16:29:08	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4188.1	photo of rings, white ring is clearly visible and a tiny bit of the underlaying green ring can be seen too	
20/09/2015	16:29:43	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4187.38333	photo of rings, white ring is clearly visible and a tiny bit of the underlaying green ring can be seen too	
20/09/2015	16:30:21	DEA Southwest EBS and Plough Track	S 07 04.9937 W 088 28.1553	4186.48571	green ring is slighlty visible but mainly covered, so penetration is sufficient	No picture
20/09/2015	16:44:58	DEA Southwest EBS and Plough Track	S 07 04.9977 W 088 28.1551	4187.3	photo of hydrozonen stem	
20/09/2015	16:45:23	DEA Southwest EBS and Plough Track	S 07 04.9979 W 088 28.1548	4187.4	photo of hydrozonen stem, attached to a nodule, outside track	
20/09/2015	16:46:00	DEA Southwest EBS and Plough Track	S 07 04.9983 W 088 28.1539	4187.4	photo of hydrozonen stem	
20/09/2015	16:46:02	DEA Southwest EBS and Plough Track	S 07 04.9983 W 088 28.1539	4187.4	estimated lenght of hydrozone is 1.20meter	No picture
20/09/2015	16:47:44	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.3	photo of accumulation of dead salps inside the track where sediment is piled up	

20/09/2015	16:48:14	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.3	photo very big isopode eating a dead salp	
20/09/2015	16:48:49	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.4	photo very big isopode eating a dead salp	
20/09/2015	16:48:58	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.4	photo very big isopode eating a dead salp	
20/09/2015	16:49:37	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.4	photo very big isopode eating a dead salp	
20/09/2015	16:50:08	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.4	photo very big isopode eating a dead salp	
20/09/2015	16:50:55	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.4	body of isopod is approx. 5-6 cm	No picture
20/09/2015	16:57:51	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4188.05	photo of chamber 3 (So242-2_D211_BFC3), green ring (12.5cm) is visible on the side where the foot of chamber was in the air	
20/09/2015	16:59:33	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4188.1	green ring means 12.5cm of water column on top from where chamber penetrated the sediment	No picture
20/09/2015	16:59:56	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4188.01429	on the other side the white ring is clearly visible	No picture
20/09/2015	17:01:25	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.9	Chamber 3-1 D211 started	No picture
20/09/2015	17:02:20	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.8	photo of isopod feeding on dead salp	
20/09/2015	17:02:50	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.8	photo of isopod feeding on dead salp	
20/09/2015	17:03:19	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.8	recording the isopod shortly	No picture

20/09/2015	17:10:41	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.57143	isopod in pot 1 of slurp gun carroussel (SO242-2_D211_SLURP_isopod1)	No picture
20/09/2015	17:23:56	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1924	4189.08824	photo of PC for geochem: 57 (SO242-2_D211_PUC57) and 73 (SO242-2_D211_PUC73) (both between two nodules)	
20/09/2015	17:24:19	DEA Southwest EBS and Plough Track	S 07 04.9665 W 088 28.1924	4189.22941	photo of PC for geochem: 57 and 73 (both between two nodules)	
20/09/2015	17:37:33	DEA Southwest EBS and Plough Track	S 07 04.9583 W 088 28.1907	4189.3	photo taken of sampling spot for PCs at rim of DEA Southwest EBS and Plough Track	
20/09/2015	17:54:07	DEA Southwest EBS and Plough Track	S 07 04.9583 W 088 28.1907	4189.4	photos of PCs: 52 (SO242-2_D211_PUC52), 60 (SO242-2_D211_PUC60), 65 (SO242-2_D211_PUC65), 26 (SO242-2_D211_PUC26), 74 (SO242-2_D211_PUC74), 35 (SO242-2_D211_PUC35), 17 (SO242-2_D211_PUC17), 37 (SO242-2_D211_PUC37) (short)	
20/09/2015	18:24:39	DEA Southwest EBS and Plough Track	S 07 04.9538 W 088 28.1949	4189.3	photo of PCs 25 (SO242-2_D211_PUC25), 5 (SO242-2_D211_PUC5), 76 (SO242-2_D211_PUC76), 33 (SO242-2_D211_PUC33), 69 (SO242-2_D211_PUC69), 32 (SO242-2_D211_PUC32) at rim of track	
20/09/2015	18:33:27	DEA Southwest EBS and Plough Track	S 07 04.9538 W 088 28.1949	4188.91429	photo taken of second rim of track pushcoring area after pushcoring	
20/09/2015	18:43:19	DEA Southwest EBS and Plough Track	S 07 04.9893 W 088 28.1598	4187.9	photo: Asteroid	
20/09/2015	18:43:42	DEA Southwest EBS and Plough Track	S 07 04.9896 W 088 28.1595	4187.8	photo: Asteroid	
20/09/2015	18:50:18	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.5	Photo: Sensors of profiler 1	
20/09/2015	18:50:31	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.5	Photo: Sensors of profiler 1	

20/09/2015	18:55:20	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.7	Photo: profiler 1 on white patch in DEA Southwest EBS and Plough Track	
20/09/2015	18:55:48	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.8	photo: Profiler 1 on white patch	
20/09/2015	18:57:42	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.24286	photo: Cnidaria	
20/09/2015	18:57:51	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.125	photo: Cnidaria	
20/09/2015	18:58:10	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187	photo: hydrozoa	
20/09/2015	19:11:28	DEA Southwest EBS and Plough Track	S 07 05.0263 W 088 28.1340	4187.3	photo of stalked sponge next to nodule	
20/09/2015	19:11:44	DEA Southwest EBS and Plough Track	S 07 05.0270 W 088 28.1338	4187.3	photo of stalked sponge next to nodule	
20/09/2015	19:13:16	DEA Southwest EBS and Plough Track	S 07 05.0287 W 088 28.1322	4187.63333	photo of blue polychaete	
20/09/2015	19:16:19	DEA Southwest EBS and Plough Track	S 07 05.0240 W 088 28.1362	4188.6	photo of sponge	
20/09/2015	19:16:23	DEA Southwest EBS and Plough Track	S 07 05.0240 W 088 28.1362	4188.6	photo sponge	No picture
20/09/2015	19:18:24	DEA Southwest EBS and Plough Track	S 07 05.0240 W 088 28.1362	4188.6	photo of sponge and biobox (SO242-2_D211_COLBOX_sponge1)	
20/09/2015	19:21:53	DEA Southwest EBS and Plough Track	S 07 05.0240 W 088 28.1362	4188.6	panorama record with camera	No picture

20/09/2015	19:30:00	DEA Southwest EBS and Plough Track	S 07 05.0330 W 088 28.1574	4187.8	photo of shitting worm	
20/09/2015	19:30:26	DEA Southwest EBS and Plough Track	S 07 05.0330 W 088 28.1574	4187.8	photo:stalked sponge	
20/09/2015	19:31:53	DEA Southwest EBS and Plough Track	S 07 05.0330 W 088 28.1574	4188	panorama record low to high	No picture
20/09/2015	19:34:31	DEA Southwest EBS and Plough Track	S 07 05.0330 W 088 28.1574	4188	taking zoom-out panoramas	No picture
20/09/2015	19:36:17	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4188.56667	photo: sponge and worm	
20/09/2015	19:38:13	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo of sponge sampling	
20/09/2015	19:40:28	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	sampling sponge into biobox (SO242-2_D211_COLBOX_sponge2)	
20/09/2015	19:42:30	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo of spiral worm	
20/09/2015	19:42:43	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo of spiral worm	
20/09/2015	19:43:12	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo of spiral worm and red jelly	
20/09/2015	19:43:27	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo: red jelly	
20/09/2015	19:43:53	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo: scotoplanes	

20/09/2015	19:46:26	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	panorama video right to left	No picture
20/09/2015	19:47:03	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo: fish	
20/09/2015	19:51:15	DEA Southwest EBS and Plough Track	S 07 05.0324 W 088 28.1589	4189.1	photo: spiral worm	
20/09/2015	19:54:34	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4189.1	photo: spiral worm	
20/09/2015	19:56:37	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4189.1	KIPS bottle A is closed now (SO242-2_D211_KIPS-A)	No picture
20/09/2015	19:57:11	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4189.08571	pumped volume : 2L, sample volume at the end 500mL	No picture
20/09/2015	19:58:17	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4188.12857	creating sediment plume when getting off the bottom for further KIPS sampling	No picture
20/09/2015	19:58:49	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4187.95714	KIPS pump: on	No picture
20/09/2015	20:03:02	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4188.1	closing bottle B (SO242-2_D211_KIPS-B)	No picture
20/09/2015	20:07:25	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4188.1	problem with KIPS: during closing of bottle B signal was lost	No picture
20/09/2015	20:08:10	DEA Southwest EBS and Plough Track	S 07 05.0310 W 088 28.1604	4188.1	turning on the KIPS again produces shortcut	No picture
20/09/2015	20:44:54	DEA Southwest EBS and Plough Track	S 07 04.9662 W 088 28.1982	4188.4	photo of fish	
20/09/2015	20:45:20	DEA Southwest EBS and Plough Track	S 07 04.9683 W 088 28.1980	4188.4	photo of 2 fishes	

20/09/2015	20:45:34	DEA Southwest EBS and Plough Track	S 07 04.9695 W 088 28.1981	4188.4	photo of fish	
20/09/2015	20:46:26	DEA Southwest EBS and Plough Track	S 07 04.9740 W 088 28.1975	4188.4	photo of amphipods on stalk	
20/09/2015	20:55:58	DEA Southwest EBS and Plough Track	S 07 04.9921 W 088 28.1835	4188.3	photo of coral	
20/09/2015	20:56:07	DEA Southwest EBS and Plough Track	S 07 04.9921 W 088 28.1835	4188.3	photo of coral	
20/09/2015	21:03:27	DEA Southwest EBS and Plough Track	S 07 05.0075 W 088 28.1863	4188.6	peniagone in chamber 2 (SO242-2_D211_SLURP_peniagone1)	No picture
20/09/2015	21:06:17	DEA Southwest EBS and Plough Track	S 07 05.0094 W 088 28.1875	4188	photo of holo	
20/09/2015	21:06:47	DEA Southwest EBS and Plough Track	S 07 05.0094 W 088 28.1875	4188.2	benthodytes ? photo	
20/09/2015	21:09:22	DEA Southwest EBS and Plough Track	S 07 05.0094 W 088 28.1875	4188.8	holo slurped and put in biobox (SO242-2_D211_COLBOX_holothurian1)	No picture
20/09/2015	21:11:15	DEA Southwest EBS and Plough Track	S 07 05.0094 W 088 28.1875	4188.8	holo was probably paeleopatides	No picture
20/09/2015	21:14:48	DEA Southwest EBS and Plough Track	S 07 05.0119 W 088 28.1759	4188.8	photo of amphipod on stalked corell	
20/09/2015	21:16:05	DEA Southwest EBS and Plough Track	S 07 05.0119 W 088 28.1759	4188.8	photo of amphipod on stalked corell	
20/09/2015	21:16:39	DEA Southwest EBS and Plough Track	S 07 05.0119 W 088 28.1759	4188.8	photo of amphipod on stalked corell	
20/09/2015	21:19:02	DEA Southwest EBS and Plough	S 07 05.0119 W 088 28.1759	4188.7	isopod slurped in chamber 3 (SO242-2_D211_SLURP_isopod2)	No picture

		Track				
20/09/2015	21:23:50	DEA Southwest EBS and Plough Track	S 07 05.0080 W 088 28.1640	4188.6	peniagone slurped	No picture
20/09/2015	21:26:07	DEA Southwest EBS and Plough Track	S 07 05.0089 W 088 28.1635	4188.6	peniagone probably in chamber 4 (SO242-2_D211_SLURP_peniagone2)	No picture
20/09/2015	21:30:17	DEA Southwest EBS and Plough Track	S 07 05.0030 W 088 28.1571	4188.4	photo of isopod (in chamber 5) (SO242-2_D211_SLURP_isopod3)	
20/09/2015	21:36:00	DEA Southwest EBS and Plough Track	S 07 04.9994 W 088 28.1540	4187.85	photo of stalk and chamber and profiler	
20/09/2015	21:37:33	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.7	photo of electrode on profiler 1	
20/09/2015	21:45:34	DEA Southwest EBS and Plough Track	S 07 04.9987 W 088 28.1510	4187.8	photo of track where Profiler 1 is	
20/09/2015	22:02:18	DEA Southwest EBS and Plough Track	S 07 04.9696 W 088 28.1709	4175.95714	OFF THE BOTTOM	No picture

created 28/09/2015 00:13:19

Dive summary

Kiel 6000 - Dive: 213-1

SO242/2 (RV Sonne)

Date: **21/09/2015**
Observers: **BOETIUS Antje, BOHSUNG Seinab, HAECKEL Matthias, JANSSEN Felix, PAUL Sophie, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.9529 W 088 28.1983**

Dive duration:

Start: **21/09/2015 13:34:56**
At bottom: **21/09/2015 15:10:43**
Leave bottom: **22/09/2015 01:29:25**
End: **22/09/2015 03:14:08**

Explored sites:

Aims of the Dive:

1. Sample DEA Southwest EBS and Plough Track with profiler, pushcores
2. sample CUBEs with blade cores, pushcores
3. plume experiment

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop
5. bladecorer boxes
6. 3 Niskins
7. KIPS
8. MAPR
9. Oxygensensors with battery
10. Biobox
11. Profiler 2 on porch (down)

On Elevator:

1. Elevator 1 up: 3 Chamber, 1 Profiler, 4 blade corer, amphitrap
2. Elevator 2 up: 4 respirometers, 2 cubes

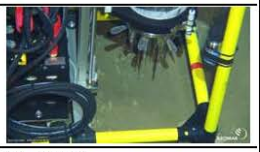
Dive summary:

Dive SO242-2_213 (protocol by Matthias Haeckel)
This was the third dive exploring the DEA Southwest EBS and Plough Track towed during Leg 1 of SO242 (about 5 weeks before this dive). We started with placing Profiler 2, which was carried down by the ROV, in the undisturbed seafloor area outside the DEA Southwest EBS and Plough Track and old plough marks, to measure in situ profiles below polymetallic nodules. However, after removal of the nodules the seafloor was too unstable and Profiler 2 fell breaking several sensors. The plan was abandoned immediately and instead only background profiles were measured. Profiler 1, which was already deployed during the previous Dive 211, was relocated inside the DEA Southwest EBS and Plough Track. Both profilers were relocated once during this dive, but within the same microhabitat. A third sediment plume experiment was conducted at the other DEA Southwest EBS and Plough Track in this part of the DEA – about 450 m further northeast. Here, plastic litter had been located by an OFOS dive earlier and the item, a plastic garbage bag with a rusting coke can, was picked up right before starting the plume experiment. The sediment was whirled up from a sediment pile at the side of the DEA Southwest EBS and Plough Track by touching down twice with the ROV. The ROV was then drifted in the sediment cloud for about 1 h. 3 Niskin bottles were fired at different times to sample the sediment particles and water in the plume. Unfortunately, the repaired KIPS system failed again after turning it on and could not be triggered. In addition to water sampling, 2 MAPR (measuring turbidity) and 3 oxygen sensors were installed for this experiment. Due to the ship's position parallel to the dominant bottom current (NE-to-SW direction) the pull on the ROV cable was too strong to keep the ROV well in the sediment cloud. The second half of the dive was dedicated to sediment coring (using push and blade corers) below CUBE 2 and 3, which had been deployed during Dive 202 (4 days earlier), and a reference site. In between the isopod and amphipod traps, attached to Elevator 1 were inspected.
Finally, the Cubes were stored on Elevator 2, while Profiler 1, 3 Chambers (from Dive 211), and 3 Blade corers were stored on Elevator 1. Both Elevators were brought up after the ROV dive. Profiler 2 was recovered by the ROV.

Dive report:

Date	Hour	Location	Latitude	Depth (m)	Comments	Picture

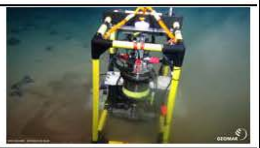
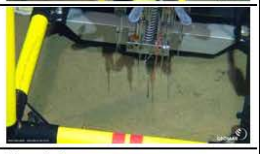
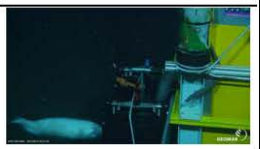
			Longitude			
21/09/2015	15:10:43	DEA Southwest EBS and Plough Track	S 07 04.9988 W 088 28.1504	4187.2	AT THE BOTTOM	No picture
21/09/2015	15:11:04	DEA Southwest EBS and Plough Track	S 07 04.9991 W 088 28.1501	4187.3	Dive start; Upper HD on	No picture
21/09/2015	15:19:47	DEA Southwest EBS and Plough Track	S 07 05.0026 W 088 28.1516	4187.5	search for large nodule in undisturbed area next to DEA Southwest EBS and Plough Track, remove it and place Profiler 2	No picture
21/09/2015	15:32:51	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	Photo of nodules to be removed	
21/09/2015	15:33:14	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	Close-up photo of nodules to be removed	
21/09/2015	15:34:10	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	remove both nodules with scoop: SO242-2_D213_nodule-x (x = 1,2)	No picture
21/09/2015	15:41:08	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	Photo of hole, where nodules were removed	
21/09/2015	15:41:26	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	Close-up photo of hole: 5 cm deep + 12 cm wide	
21/09/2015	15:48:26	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	hole is enlarged for profiler	No picture
21/09/2015	16:01:27	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.3	Profiler 2 fell over when placed on hole -> experiment stopped, many sensors are broken. Now just reference measurement with a few remaining sensors	No picture
21/09/2015	16:02:00	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.2	Profiler 2 placed and started: SO242-2_D213_MICP2-1	No picture

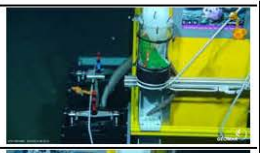
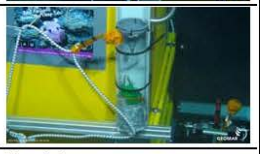
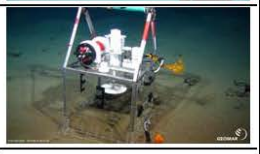
21/09/2015	16:02:06	DEA Southwest EBS and Plough Track	S 07 05.0220 W 088 28.1526	4189.2	Close-up photo of Profiler 2 sensors on undisturbed sediment south of track	
21/09/2015	16:08:25	DEA Southwest EBS and Plough Track	S 07 05.0111 W 088 28.1530	4186.7	fly to Profiler 1 (SO242-2_D211_MICP1-3) for relocating	No picture
21/09/2015	16:23:26	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.8	Profiler 1 placed in DEA Southwest EBS and Plough Track: SO242-2_D213_MICP1-1	No picture
21/09/2015	16:26:36	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.8	Close-up photo of Profiler 1 sensors on DEA Southwest EBS and Plough Track surface	
21/09/2015	16:27:07	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.8	fly on to Matthias litter area for plume experiment	No picture
21/09/2015	16:27:31	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.8	Overview photo of Profiler 1 in DEA Southwest EBS and Plough Track	
21/09/2015	16:30:39	DEA Southwest EBS and Plough Track	S 07 05.0013 W 088 28.1409	4184.46667	nodules south of DEA Southwest EBS and Plough Track have no sediment cover, but nodules south of old plough track have a lot of sediment cover	No picture
21/09/2015	16:35:05	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1329	4186.45714	fly ~450 m northeast to southern end of other DEA Southwest EBS and Plough Track for sediment plume experiment	No picture
21/09/2015	16:35:09	DEA Southwest EBS and Plough Track	S 07 04.9721 W 088 28.1326	4186.48333	use transect to annotate fauna (see observations protocol)	No picture
21/09/2015	17:07:25	DEA Southwest EBS and Plough Track	S 07 04.7902 W 088 28.0729	4178.20909	Photo of slurp gun accidentally taken by ROV pilot	
21/09/2015	17:08:36	DEA Southwest EBS and Plough Track	S 07 04.7838 W 088 28.0731	4178.1	Photo of sleeping fish on seafloor	
21/09/2015	17:19:57	DEA Southwest EBS and Plough Track	S 07 04.7544 W 088 28.0642	4176.1	fly plough mark along in eastern direction for search of plastic bag	No picture

21/09/2015	17:32:59	DEA Southwest EBS and Plough Track	S 07 04.7730 W 088 28.0896	4177.5	Photo of old plough mark taken during flight	
21/09/2015	17:34:57	DEA Southwest EBS and Plough Track	S 07 04.7729 W 088 28.0848	4177.46667	Photo of old plough mark taken during flight	
21/09/2015	17:50:55	DEA Southwest EBS and Plough Track	S 07 04.7674 W 088 28.0652	4177.1	Photo of found plastic bag	
21/09/2015	17:52:11	DEA Southwest EBS and Plough Track	S 07 04.7658 W 088 28.0670	4177.2	Close-up photo of plastic bag with a coke can inside	
21/09/2015	17:59:21	DEA Southwest EBS and Plough Track	S 07 04.7659 W 088 28.0713	4178.7	Photo of sampled plastic bag; litter is stored in Biobox: SO242-2_D213_Plastic	
21/09/2015	18:09:24	DEA Southwest EBS and Plough Track	S 07 04.7638 W 088 28.0716	4175	Photo of EBS side pile, which will be used to create sediment plume	
21/09/2015	18:15:17	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4176.4	trying to turn on KIPS system before plume experiment: KIPS does not work	No picture
21/09/2015	18:15:29	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4176.6625	sediment plume experiment started by touching down with ROV twice onto EBS side pile	No picture
21/09/2015	18:16:18	DEA Southwest EBS and Plough Track	S 07 04.7595 W 088 28.0744	4177.5	drifting with ROV downcurrent in 1 m height above seafloor	No picture
21/09/2015	18:18:03	DEA Southwest EBS and Plough Track	S 07 04.7601 W 088 28.0759	4177.8625	lowering ROV down to 0.5 m above seafloor	No picture
21/09/2015	18:20:15	DEA Southwest EBS and Plough Track	S 07 04.7630 W 088 28.0771	4178.2	ROV is drifting with 2 cm/s with current	No picture
21/09/2015	18:25:46	DEA Southwest EBS and Plough Track	S 07 04.7695 W 088 28.0823	4178.3	ROV drifted out of cloud	No picture

21/09/2015	18:29:01	DEA Southwest EBS and Plough Track	S 07 04.7753 W 088 28.0829	4178.6	flying back into cloud and lowering ROV to 0.2 m above seafloor	No picture
21/09/2015	18:29:25	DEA Southwest EBS and Plough Track	S 07 04.7758 W 088 28.0827	4178.62857	Photo of created and drifting sediment cloud	
21/09/2015	18:31:34	DEA Southwest EBS and Plough Track	S 07 04.7797 W 088 28.0835	4178.6	ROV drifting 0.4 m above seafloor	No picture
21/09/2015	18:31:56	DEA Southwest EBS and Plough Track	S 07 04.7799 W 088 28.0834	4178.6	ROV drifted again out of cloud	No picture
21/09/2015	18:39:59	DEA Southwest EBS and Plough Track	S 07 04.7791 W 088 28.0887	4177.4	ROV is flying back into sediment plume	No picture
21/09/2015	18:40:24	DEA Southwest EBS and Plough Track	S 07 04.7796 W 088 28.0892	4178.18333	left Niskin bottle is fired: SO242-2_D213_NIS1	No picture
21/09/2015	18:44:32	DEA Southwest EBS and Plough Track	S 07 04.7825 W 088 28.0932	4178.9	ROV had drifted slightly out of the plume again for a few seconds	No picture
21/09/2015	18:57:37	DEA Southwest EBS and Plough Track	S 07 04.7842 W 088 28.0950	4178.9	middle Niskin bottle is fired: SO242-2_D213_NIS2 (~2 min after ROV had whirled up new sediment from ist porch)	No picture
21/09/2015	19:03:30	DEA Southwest EBS and Plough Track	S 07 04.7853 W 088 28.0971	4179	ROV has drifted out of cloud again	No picture
21/09/2015	19:03:54	DEA Southwest EBS and Plough Track	S 07 04.7855 W 088 28.0979	4179.02857	Sediment plume is very dilute now; ROV is flying back into cloud	No picture
21/09/2015	19:05:48	DEA Southwest EBS and Plough Track	S 07 04.7851 W 088 28.1010	4179	right Niskin is fired: SO242-2_D213_NIS3	No picture
21/09/2015	19:06:10	DEA Southwest EBS and Plough Track	S 07 04.7850 W 088 28.1013	4178.98571	Photo of dilute sediment plume	
21/09/2015	19:21:48	DEA Southwest EBS and Plough Track	S 07 04.9022 W 088 28.1414	4177.4	end of plume experiment; flying back to Profiler 1 in western DEA Southwest EBS and Plough Track	No picture

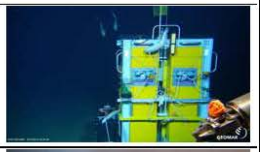
21/09/2015	19:41:23	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.02857	Photo of Profiler 1 (SO242-2_D213_MICP1-1), LED is on	
21/09/2015	19:41:37	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.12857	another photo of Profiler 1	
21/09/2015	19:42:38	DEA Southwest EBS and Plough Track	S 07 05.0031 W 088 28.1425	4187.6	picking up Profiler 1 and flying along track in SE direction	No picture
21/09/2015	19:46:37	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4186.73333	Photo of new location for Profiler 1	
21/09/2015	19:48:23	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.3	Placing Profiler 1 despite the poor visibility due to sediment plume	No picture
21/09/2015	19:50:11	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.3	taking magnetic stick to activate prof1	No picture
21/09/2015	19:50:48	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.3	Profiler 1 started with magnetic stick: SO242-2_D213_MICP1-2	No picture
21/09/2015	19:52:19	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.4	Photo of Profiler 1 inside DEA Southwest EBS and Plough Track	
21/09/2015	19:53:14	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.4	Close-up photo of sensors above sediment surface	
21/09/2015	19:53:35	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.4	Overview photo of Profiler 1 in DEA Southwest EBS and Plough Track	
21/09/2015	19:55:39	DEA Southwest EBS and Plough Track	S 07 05.0149 W 088 28.1380	4186.2	flying to Profiler 2 for relocation (change of action 7: no nodule removal, only undisturbed area)	No picture
21/09/2015	20:00:47	DEA Southwest EBS and Plough Track	S 07 05.0278 W 088 28.1503	4186.54286	Profiler 2 picked up	No picture

21/09/2015	20:01:01	DEA Southwest EBS and Plough Track	S 07 05.0285 W 088 28.1499	4186.4	Photo of undisturbed area for placement of Profiler 2	
21/09/2015	20:02:17	DEA Southwest EBS and Plough Track	S 07 05.0317 W 088 28.1483	4186.6	ROV created sediment plume -> shifting position a little	No picture
21/09/2015	20:02:17	DEA Southwest EBS and Plough Track	S 07 05.0317 W 088 28.1483	4186.6	Photo of new undisturbed spot for Profiler 2	
21/09/2015	20:03:21	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4187.58571	Profiler 2 placed on seafloor	No picture
21/09/2015	20:10:49	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4188.9	Photo of Profiler 2 on undisturbed seafloor outside DEA Southwest EBS and Plough Track	
21/09/2015	20:11:00	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4188.9	another photo of Profiler 2	
21/09/2015	20:12:01	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4188.9	Close-up photo of sensors above seafloor; Profiler 2 started: SO242-2_D213_MICP2-2	
21/09/2015	20:17:46	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4188.9	push coring for Xray next to Profiler 2	No picture
21/09/2015	20:19:04	DEA Southwest EBS and Plough Track	S 07 05.0342 W 088 28.1479	4188.9	Photo of slightly tilted push core: SO242-2_D213_PUC75	
21/09/2015	20:23:23	DEA Southwest EBS and Plough Track	S 07 05.0298 W 088 28.1511	4187.36667	flying NW towards elevator 1 for inspection of isopod and amphipod traps	No picture
21/09/2015	20:31:53	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4186.7	Photo of isopod traps	

21/09/2015	20:32:35	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4187	Photo of left amphipod trap	
21/09/2015	20:33:58	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4187.2	Photo of right amphipod trap	
21/09/2015	20:36:51	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.1	pick up blade corer 2 from elevator 1 and fly to Cube 3	No picture
21/09/2015	20:47:29	DEA Southwest EBS and Plough Track	S 07 04.9760 W 088 28.1606	4186.8	Photo of Cubes while approaching (Cube 3 is in front)	
21/09/2015	20:51:04	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.07143	Close-up photo of Cube 3 (SO242-2_D202_BFC3): plate is stirring/turning; Syringes were all released (except the last one); algae were injected	
21/09/2015	20:59:58	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Door of Cube 3 is opened	No picture
21/09/2015	21:01:07	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Cube 3 is lifted with monkey fist	No picture
21/09/2015	21:03:28	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Photo of nicely visible bezel print	
21/09/2015	21:06:57	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	push coring in bezel print	No picture
21/09/2015	21:13:15	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Photo of push cores: SO242-2_D213_PUCx (x = 58,72,81)	
21/09/2015	21:17:53	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Bladecorer 2 is pushed into the sediment: SO242-2_D213_XXX2	No picture
21/09/2015	21:18:11	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Photo of PUCs and Bladecorer 2	

21/09/2015	21:20:04	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4188.6	Bladecorer 2 is triggered and then PUCs and Bladecorer 2 retrieved	No picture
21/09/2015	21:36:41	DEA Southwest EBS and Plough Track	S 07 04.9875 W 088 28.1844	4187.1	flying back to Elevator 1 to return Bladecorer 2	No picture
21/09/2015	21:45:59	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.34286	Bladecorer 1 is picked up from Elevator 1	No picture
21/09/2015	21:48:56	DEA Southwest EBS and Plough Track	S 07 04.9868 W 088 28.1834	4187.6	flying to Cube 2	No picture
21/09/2015	21:51:09	DEA Southwest EBS and Plough Track	S 07 04.9797 W 088 28.1689	4187.3	Photo of fish	
21/09/2015	21:51:25	DEA Southwest EBS and Plough Track	S 07 04.9791 W 088 28.1680	4187.3	Photo of fish	
21/09/2015	21:51:51	DEA Southwest EBS and Plough Track	S 07 04.9785 W 088 28.1669	4187.3	Photo of fish	
21/09/2015	21:57:18	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.38571	Photo of Cube 2 (SO242-2_D202_BFC2): Stirrer is still turning, syringes have all been released, algae were injected, door is open	
21/09/2015	22:00:29	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Cube 2 is lifted	No picture
21/09/2015	22:01:30	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Photo of visible bezel print	
21/09/2015	22:02:55	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	push coring in bezel print	No picture
21/09/2015	22:09:54	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Photo of push cores: SO242-2_D213_PUCx (x = 20,53,67)	

21/09/2015	22:13:25	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Bladecorer 1 is pushed into the sediment: SO242-2_D213_XXX1	No picture
21/09/2015	22:13:30	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Photo of PUCs and Bladecorer 1	
21/09/2015	22:16:24	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Bladecorer 1 is fired and then PUCs are retrieved	No picture
21/09/2015	22:21:57	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	push core 46 is taken	No picture
21/09/2015	22:22:48	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	push coring the sediment outside the bezel print	No picture
21/09/2015	22:22:51	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.5	Photo of push core 46: SO242-2_D213_PUC46	
21/09/2015	22:24:44	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.35	Push core and Bladecorer 1 are retrieved	No picture
21/09/2015	22:29:34	DEA Southwest EBS and Plough Track	S 07 04.9899 W 088 28.1863	4187.3	flying back to Elevator 1 to return Bladecorer 1	No picture
21/09/2015	22:32:35	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.5	Bladecorer 1 is put back into rack on elevator 1	No picture
21/09/2015	22:35:08	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188	Photo of fish in isopod trap	
21/09/2015	22:36:57	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	Photo of fish lying on bladecorer	
21/09/2015	22:37:46	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.05714	Photo of fish on elevator 1 and on seafloor in front of elevator	

21/09/2015	22:43:35	DEA Southwest EBS and Plough Track	S 07 04.9736 W 088 28.1581	4186.88571	return to Cubes and bring to Elevator 2	No picture
21/09/2015	22:43:52	DEA Southwest EBS and Plough Track	S 07 04.9742 W 088 28.1600	4186.7	Cube 3 is picked up first	No picture
21/09/2015	22:54:28	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4187.93333	Cube 3 is put onto elevator 2, but not secured yet	No picture
21/09/2015	22:56:45	DEA Southwest EBS and Plough Track	S 07 04.9704 W 088 28.1654	4186.47143	flying to Cube 2 to pick it up	No picture
21/09/2015	23:00:05	DEA Southwest EBS and Plough Track	S 07 04.9710 W 088 28.1529	4187.3	picking up Cube 2 and bring it to elevator 2	No picture
21/09/2015	23:06:48	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4187.7	Cube 2 is put onto elevator 2	No picture
21/09/2015	23:21:27	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.17143	Cubes are secured	No picture
21/09/2015	23:23:16	DEA Southwest EBS and Plough Track	S 07 04.9789 W 088 28.1672	4186.2	flying to Chamber 1 and 2 for pick-up to Elevator 1	No picture
21/09/2015	23:25:41	DEA Southwest EBS and Plough Track	S 07 04.9894 W 088 28.1543	4187.77143	pick up Chamber 1 (SO242-2_D211_BFC1)	No picture
21/09/2015	23:26:44	DEA Southwest EBS and Plough Track	S 07 04.9916 W 088 28.1547	4187.11429	pick up Chamber 2 (SO242-2_D211_BFC2)	No picture
21/09/2015	23:29:56	DEA Southwest EBS and Plough Track	S 07 04.9928 W 088 28.1879	4187.51429	Photo of 3 fishes at Elevator 1	
21/09/2015	23:34:08	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	Photo of fish at elevator 1	
21/09/2015	23:34:18	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	another photo of fish at elevator 1	

21/09/2015	23:34:40	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	another photo of fish at elevator 1	
21/09/2015	23:35:16	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	another photo of fish at elevator 1	
21/09/2015	23:35:30	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.4	another photo of fish at elevator 1	
21/09/2015	23:37:19	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4187.8	Chambers 1 and 2 put on elevator 1	No picture
21/09/2015	23:44:39	DEA Southwest EBS and Plough Track	S 07 04.9714 W 088 28.1573	4188.21667	fly to Elevator 1 to pick up bladecorer 4 for coring of undisturbed area next to track	No picture
22/09/2015	00:12:52	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4187.58571	Photo of fish (eel) in isopod trap of Elevator 1; then fly to undisturbed area outside DEA Southwest EBS and Plough Track	
22/09/2015	00:18:08	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.3	Photo of Bladecorer 4 above undisturbed sediment area	
22/09/2015	00:19:22	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.6	push Bladecorer 4 into sediment and trigger it: SO242-2_D213_XXX4	No picture
22/09/2015	00:20:41	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.6	push coring at same spot	No picture
22/09/2015	00:21:37	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.6	pushcore 61 is pressed into sediment	No picture
22/09/2015	00:24:15	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.6	Photo of push cores: SO242-2_D213_PUCx (x = 10,61,79)	
22/09/2015	00:27:52	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.21429	Retrieving push cores and Bladecorer 4	No picture

22/09/2015	00:31:09	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.27143	Bladecorer 4 is secured on elevator 1; fly to Chamber 3 for pick-up	No picture
22/09/2015	00:37:33	DEA Southwest EBS and Plough Track	S 07 04.9983 W 088 28.1490	4188.11429	picking up Chamber 3 (SO242-2_D211_BFC3)	No picture
22/09/2015	00:41:05	DEA Southwest EBS and Plough Track	S 07 05.0091 W 088 28.1382	4187.6	fly to Profiler 1 for pick-up	No picture
22/09/2015	00:42:40	DEA Southwest EBS and Plough Track	S 07 04.9727 W 088 28.1239	4187.15714	picking up Profiler 1 and bringing both to elevator 1	No picture
22/09/2015	00:49:41	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4187.94286	Putting profiler 1 on elevator 1	No picture
22/09/2015	00:50:02	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.02857	Putting chamber 3 on elevator 1	No picture
22/09/2015	00:58:10	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4189.8	Securing the Chamber 1+2+3 and Profiler	No picture
22/09/2015	01:12:37	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.7	Everything secured on Elevator 1: pulling floating line	No picture
22/09/2015	01:13:03	DEA Southwest EBS and Plough Track	S 07 04.9946 W 088 28.1904	4188.6	Photo of fish at elevator 1; flying to Profiler 2 for pick-up	
22/09/2015	01:28:20	DEA Southwest EBS and Plough Track	S 07 05.0305 W 088 28.1504	4186.35714	Profiler 2 picked up and secured on ROV porch	No picture
22/09/2015	01:29:00	DEA Southwest EBS and Plough Track	S 07 05.0281 W 088 28.1534	4185.42857	End of Dive 213	No picture
22/09/2015	01:29:25	DEA Southwest EBS and Plough Track	S 07 05.0253 W 088 28.1557	4182.96667	OFF THE BOTTOM	No picture
22/09/2015	01:48:15	DEA Southwest EBS and Plough Track	S 07 04.9828 W 088 28.1718	3484.54286	Upper HD off	No picture

created 28/09/2015 00:17:52

Dive summary

Kiel 6000 - Dive: 216-1

SO242/2 (RV Sonne)

Date: **22/09/2015**
Observers: **BOETIUS Antje, BOHSUNG Seinab, JANSSEN Felix, LINS Lidia, MEVENKAMP Lisa, STRATMANN Tanja, VAN OEVELEN Dick, WENZHOEFER Frank**
Position: **S 07 07.5098 W 088 27.0217**

Dive duration:

Start: **22/09/2015 15:01:08**
At bottom: **22/09/2015 16:36:50**
Leave bottom: **23/09/2015 03:12:45**
End: **23/09/2015 05:04:12**

Explored sites:

Aims of the Dive:

1. Sample sediment deposition experiment (push coring)
2. push coring
3. profiler deployment
4. Holothurian and salp collection
5. checking out crawler

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop

On Elevator:

1. None

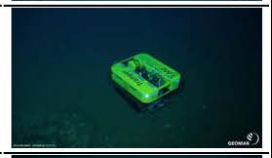
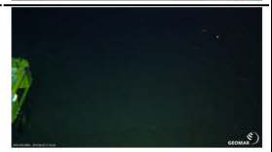
Dive summary:

Dive SO242-2_216 (protocol by Lisa Mevenkamp)
Dive 216 started with the observation of the Crawler on the bottom. It seemed to have crawled as planned, but later this dive it was found out that the profiler did not work and, additionally, the release malfunctioned and the Crawler was brought back by means of a wire from the ship that was attached to the Crawler by the ROV. One microprofiler was deployed on a spot under a nodule after removal of the nodule. It was re-deployed later that dive, again on a spot under a nodule. The sampling of the Sediment deposition experiment with two push cores per experimental core went as planned and without problems. Background push core samples close to the Meiofauna corral site were taken. During dive 216 one salp, four holothurians, one crab with anemone, one isopod and a piece of trash were collected. The holothurian of the handnet sampling was lost during ascent.

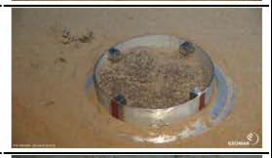
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
22/09/2015	16:36:50	Southern Reference (Outside DEA)	S 07 07.5221 W 088 27.0326	4178.61429	AT THE BOTTOM	No picture
22/09/2015	16:44:28	Southern Reference (Outside DEA)	S 07 07.5314 W 088 27.0384	4195	Observing crawler at seafloor, it moved 10m as planned	No picture

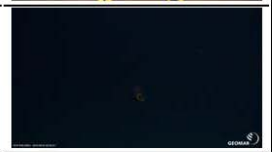
22/09/2015	16:48:44	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4196.55	Photo: site for nodule removal	
22/09/2015	16:48:46	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4196.58333	Photo: site for nodule removal	
22/09/2015	16:49:30	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.07143	Photo: site for nodule removal	
22/09/2015	16:49:50	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.38333	Photo: site for nodule removal	
22/09/2015	16:50:30	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.4	Photo: site for nodule removal	
22/09/2015	16:58:23	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.4	Photo: site after removal of three nodules	
22/09/2015	17:01:03	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.4	Lower HD rec. on	No picture
22/09/2015	17:01:12	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.4	lower HD ON	No picture
22/09/2015	17:07:21	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.5	Photo: MICP 2-1 (Profiler 2-1) placed above nodule removal spot and started	
22/09/2015	17:07:34	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.5	Photo: MICP 2-1	
22/09/2015	17:08:24	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.5	Photo: MICP 2-1	

22/09/2015	17:08:37	Southern Reference (Outside DEA)	S 07 07.5227 W 088 27.0396	4197.5	Lower HD rec. off	No picture
22/09/2015	17:14:46	Southern Reference (Outside DEA)	S 07 07.5282 W 088 27.0417	4192.15714	Lower HD rec. On for crawler observation	No picture
22/09/2015	17:16:10	Southern Reference (Outside DEA)	S 07 07.5344 W 088 27.0376	4194.38571	Photo: Crawler on seafloor	
22/09/2015	17:17:12	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4195.38571	Photo: Crawler on seafloor	
22/09/2015	17:18:03	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4196.36667	Photo: Crawler on seafloor	
22/09/2015	17:24:55	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.3	Photo: close up on Crawler sensors	
22/09/2015	17:27:12	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.4	Photo: Crawler on seafloor	
22/09/2015	17:28:07	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.4	Lower HD rec. off	No picture
22/09/2015	17:29:17	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.4	Photo: Crawler is still profiling	
22/09/2015	17:33:51	Southern Reference (Outside DEA)	S 07 07.5359 W 088 27.0373	4196.91429	Photo: Crawler on seafloor	
22/09/2015	17:34:42	Southern Reference (Outside DEA)	S 07 07.5353 W 088 27.0366	4196.7	Photo: Crawler track	

22/09/2015	17:34:56	Southern Reference (Outside DEA)	S 07 07.5351 W 088 27.0368	4196.65	Photo: Crawler track	
22/09/2015	17:35:11	Southern Reference (Outside DEA)	S 07 07.5350 W 088 27.0371	4196.51667	Photo: Crawler with track	
22/09/2015	17:35:15	Southern Reference (Outside DEA)	S 07 07.5349 W 088 27.0371	4196.5	photo crawler track	No picture
22/09/2015	17:36:22	Southern Reference (Outside DEA)	S 07 07.5336 W 088 27.0394	4196.4	Photo: Crawler landing spot	
22/09/2015	17:37:03	Southern Reference (Outside DEA)	S 07 07.5332 W 088 27.0408	4196.3	Photo: Crawler track	
22/09/2015	17:37:17	Southern Reference (Outside DEA)	S 07 07.5330 W 088 27.0409	4196.3	Photo: Crawler with track	
22/09/2015	17:57:46	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.7	Photo: PUC 83 and 13 in EXP-4 (Experimental core Control 1)	
22/09/2015	17:58:02	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.7	SO242-2_D216_PUC83	No picture
22/09/2015	17:58:02	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.7	SO242-2_D216_PUC13	No picture
22/09/2015	18:02:41	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.7	Photo: EXP-4 (Experimental core Control 1) after push core removal	
22/09/2015	18:03:37	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.7	EXP-4 (Experimental core Control 1) collected into the ROV drawer	No picture
22/09/2015	18:17:01	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.45714	Photo: EXP-5 (Experimental core Control 2) and EXP-6 (Experimental core Control 3) befor push coring	

22/09/2015	18:28:04	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	Photo: EXP-5 (Experimental core Control 2) and EXP-6 (Experimental core Control 3) with push cores	
22/09/2015	18:28:18	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	Photo: EXP-6 (Experimental core Control 3) with push cores	
22/09/2015	18:28:32	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	Photo: EXP-5 (Experimental core Control 2) with push cores	
22/09/2015	18:29:59	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	SO242-2_D216_PUC5	No picture
22/09/2015	18:32:06	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	SO242-2_D216_PUC22	No picture
22/09/2015	18:33:34	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	SO242-2_D216_PUC12	No picture
22/09/2015	18:35:16	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	SO242-2_D216_PUC62	No picture
22/09/2015	18:47:37	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.6	EXP-5 and EXP-6 (Experimental cores Control 2 and 3) retrieved in port ROV drawer	No picture
22/09/2015	18:55:36	Southern Reference (Outside DEA)	S 07 07.5082 W 088 27.0190	4196.5	Marker 1 retrieved in port ROV drawer	No picture
22/09/2015	19:08:52	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.65556	Photo: EXP-3 (Experimental core SD3) before push coring	
22/09/2015	19:09:05	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	Photo: EXP-2 (Experimental core SD2) before push coring	
22/09/2015	19:09:30	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.74444	Photo: EXP-1 (Experimental core SD1) before push coring	

22/09/2015	19:19:10	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	Photo: EXP-3 (Experimental core SD3) with push cores	
22/09/2015	19:30:12	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	Photo: EXP-2 (Experimental core SD2) with push cores	
22/09/2015	19:31:23	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	SO242-2_D216_PUC37	No picture
22/09/2015	19:34:40	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	SO242-2_D216_PUC32	No picture
22/09/2015	19:36:20	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	SO242-2_D216_PUC14	No picture
22/09/2015	19:38:30	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.7	SO242-2_D216_PUC34	No picture
22/09/2015	19:46:00	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.6	EXP-2 and EXP-3 (Experimental cores SD2 and SD3) retrieved in starboard ROV drawer	No picture
22/09/2015	19:51:06	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.44444	Photo: EXP-1 (Experimental core SD1) before push coring	
22/09/2015	19:57:42	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.6	Photo: EXP-1 (Experimental core SD1) with push cores	
22/09/2015	19:59:20	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.6	SO242-2_D216_PUC47	No picture
22/09/2015	20:00:38	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.6	SO242-2_D216_PUC25	No picture
22/09/2015	20:06:01	Southern Reference (Outside DEA)	S 07 07.5112 W 088 27.0193	4196.6	EXP-1 (Experimental core SD1) retrieved in starboard ROV drawer	No picture
22/09/2015	20:25:07	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	Photo: target nodule site for nodule removal	

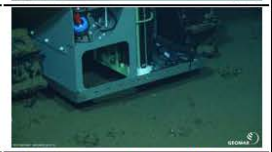
22/09/2015	20:25:22	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	Photo: 3 nodules targeted for removal	
22/09/2015	20:25:41	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	SO242-2_D216_Nodule1	No picture
22/09/2015	20:27:46	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	SO242-2_D216_Nodule2	No picture
22/09/2015	20:29:42	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	SO242-2_D216_Nodule3	No picture
22/09/2015	20:33:48	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.42857	Photo: site after removal of three nodules	
22/09/2015	20:38:48	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	Photo: MICP-2-2 placement	
22/09/2015	20:39:05	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	Photo: MICP-2-2 close up	
22/09/2015	20:42:21	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4198.4	Photo: MICP-2-2 started	
22/09/2015	20:52:01	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.01538	Photo: swimming holothurian	
22/09/2015	20:52:32	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.23043	Photo: swimming holothurian	
22/09/2015	20:56:35	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.7	SO242-2_D216_PUC35	No picture
22/09/2015	20:57:34	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.7	SO242-2_D216_PUC40	No picture

22/09/2015	20:58:11	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.7	SO242-2_D216_PUC69	No picture
22/09/2015	20:58:56	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.7	SO242-2_D216_PUC65	No picture
22/09/2015	20:59:12	Southern Reference (Outside DEA)	S 07 07.5226 W 088 27.0635	4196.7	Photo: sampled push cores	
22/09/2015	21:07:48	Southern Reference (Outside DEA)	S 07 07.5278 W 088 27.0512	4196.28571	Photo: Dead salps	
22/09/2015	21:08:59	Southern Reference (Outside DEA)	S 07 07.5278 W 088 27.0512	4196.7	Photo: Dead salps	
22/09/2015	21:09:15	Southern Reference (Outside DEA)	S 07 07.5278 W 088 27.0512	4196.8	Photo: Dead salps	
22/09/2015	21:09:29	Southern Reference (Outside DEA)	S 07 07.5278 W 088 27.0512	4196.825	Photo: Dead salps	
22/09/2015	21:20:49	Southern Reference (Outside DEA)	S 07 07.5312 W 088 27.0522	4196	Photo: Crab legs	
22/09/2015	21:21:38	Southern Reference (Outside DEA)	S 07 07.5342 W 088 27.0531	4196.13333	Photo: Isopod	
22/09/2015	21:23:44	Southern Reference (Outside DEA)	S 07 07.5440 W 088 27.0537	4196.77778	Photo: Holothurian	
22/09/2015	21:23:53	Southern Reference (Outside DEA)	S 07 07.5444 W 088 27.0535	4196.8	Photo: Holothurian	

22/09/2015	21:24:49	Southern Reference (Outside DEA)	S 07 07.5460 W 088 27.0515	4197.0625	Photo: Holothurian	
22/09/2015	21:26:54	Southern Reference (Outside DEA)	S 07 07.5460 W 088 27.0515	4197.4	SO242-2_216_COLBOX1 (Senckenberg biobox) Holothurian, species unknown	No picture
22/09/2015	21:31:50	Southern Reference (Outside DEA)	S 07 07.5458 W 088 27.0462	4197.6	Photo: tape from boxcorer that came loose	
22/09/2015	21:34:34	Southern Reference (Outside DEA)	S 07 07.5469 W 088 27.0445	4197.5	SO242-2_216_Trash1	No picture
22/09/2015	21:36:11	Southern Reference (Outside DEA)	S 07 07.5483 W 088 27.0450	4197.6	Photo: TV grab scar	
22/09/2015	21:38:30	Southern Reference (Outside DEA)	S 07 07.5558 W 088 27.0465	4198.1	Photo: crab without anemone	
22/09/2015	21:39:14	Southern Reference (Outside DEA)	S 07 07.5565 W 088 27.0451	4198.2	Photo: Basicidus, fish	
22/09/2015	21:39:36	Southern Reference (Outside DEA)	S 07 07.5565 W 088 27.0445	4198.2	Photo: Basicidus, fish	
22/09/2015	21:40:00	Southern Reference (Outside DEA)	S 07 07.5562 W 088 27.0432	4198.3	Photo: Basicidus, fish	
22/09/2015	21:40:18	Southern Reference (Outside DEA)	S 07 07.5563 W 088 27.0428	4198.3	Photo: Basicidus, fish	
22/09/2015	21:40:45	Southern Reference (Outside DEA)	S 07 07.5569 W 088 27.0425	4198.31667	Photo: Basicidus, fish	

22/09/2015	21:41:02	Southern Reference (Outside DEA)	S 07 07.5573 W 088 27.0421	4198.4	Photo: Basicidus, fish	
22/09/2015	21:44:41	Southern Reference (Outside DEA)	S 07 07.5724 W 088 27.0439	4199.1	Photo: large burrow	
22/09/2015	21:44:50	Southern Reference (Outside DEA)	S 07 07.5731 W 088 27.0437	4199.1	Photo: large burrow	
22/09/2015	21:49:42	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4199.7	Photo: Benthodytes holothurian	
22/09/2015	21:49:51	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4199.7	Photo: Benthodytes holothurian	
22/09/2015	21:50:05	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4199.7	Photo: Benthodytes holothurian	
22/09/2015	21:50:12	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4199.7	Photo: Benthodytes holothurian	
22/09/2015	21:58:48	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4200.3	SO242-2_216_NET1, Benthodytes holothurian in handnet in port ROV drawer, was lost during ascent	No picture
22/09/2015	21:59:56	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4200.3	Photo: crab without anemone	
22/09/2015	22:02:34	Southern Reference (Outside DEA)	S 07 07.5823 W 088 27.0410	4199.6	Photo: Hydroid	

22/09/2015	22:03:17	Southern Reference (Outside DEA)	S 07 07.5849 W 088 27.0404	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:04:01	Southern Reference (Outside DEA)	S 07 07.5862 W 088 27.0402	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:04:16	Southern Reference (Outside DEA)	S 07 07.5866 W 088 27.0404	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:04:31	Southern Reference (Outside DEA)	S 07 07.5867 W 088 27.0403	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:04:43	Southern Reference (Outside DEA)	S 07 07.5869 W 088 27.0401	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:04:57	Southern Reference (Outside DEA)	S 07 07.5869 W 088 27.0399	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:05:08	Southern Reference (Outside DEA)	S 07 07.5870 W 088 27.0399	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:05:23	Southern Reference (Outside DEA)	S 07 07.5869 W 088 27.0397	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:06:19	Southern Reference (Outside DEA)	S 07 07.5867 W 088 27.0385	4199.7	Photo: unknown holothurian spec.	
22/09/2015	22:09:48	Southern Reference (Outside DEA)	S 07 07.5816 W 088 27.0329	4199.6	Photo: Holothurian	
22/09/2015	22:14:04	Southern Reference (Outside	S 07 07.5804 W 088	4199.7	SO242-2_216_SLURP2, crab with anemone	No picture

		DEA)	27.0347			
22/09/2015	22:15:34	Southern Reference (Outside DEA)	S 07 07.5818 W 088 27.0355	4199.6	SO242-2_216_SLURP3, Isopod	No picture
22/09/2015	22:17:26	Southern Reference (Outside DEA)	S 07 07.5812 W 088 27.0356	4199.35714	SO242-2_216_SLURP4, Peniagone holothurian	No picture
22/09/2015	22:18:46	Southern Reference (Outside DEA)	S 07 07.5756 W 088 27.0360	4199.2	Photo: Psychropotes holothurian	
22/09/2015	22:19:36	Southern Reference (Outside DEA)	S 07 07.5719 W 088 27.0360	4199.1	Photo: Holothurian (Synelactus?)	
22/09/2015	22:23:20	Southern Reference (Outside DEA)	S 07 07.5655 W 088 27.0360	4198.34286	SO242-2_216_SLURP6, Holothurian	No picture
22/09/2015	22:27:57	Southern Reference (Outside DEA)	S 07 07.5416 W 088 27.0378	4196.6	Photo: observing Crawler on seafloor	
22/09/2015	22:28:18	Southern Reference (Outside DEA)	S 07 07.5417 W 088 27.0375	4196.7	Photo: Picture to see penetration depth of crawler	
22/09/2015	22:28:40	Southern Reference (Outside DEA)	S 07 07.5415 W 088 27.0371	4196.7	Photo: Zoom in on Caterpillar drive	
22/09/2015	22:30:55	Southern Reference (Outside DEA)	S 07 07.5404 W 088 27.0356	4197.2	Photo: Caterpillar drive of crawler	
22/09/2015	22:31:12	Southern Reference (Outside DEA)	S 07 07.5401 W 088 27.0353	4197.3	Photo: Caterpillar drive of crawler	
22/09/2015	22:36:17	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.3	Photo: Sensors of profiler in Crawler	

22/09/2015	22:37:59	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.4	Lower HD rec. on	No picture
22/09/2015	22:39:23	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.5	Lower HD rec. off	No picture
22/09/2015	22:40:22	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.6	Lower HD rec. off	No picture
22/09/2015	22:41:41	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4197.5	Photo: Profiler on crawler, checkup on sensors	
22/09/2015	22:45:34	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4196.3	Photo: Crawler and swimming holothurian	
22/09/2015	22:54:06	Southern Reference (Outside DEA)	S 07 07.5504 W 088 27.0494	4197	MICP-2-2 taken on ROV porch	No picture
22/09/2015	23:38:52	Southern Reference (Outside DEA)	S 07 07.5353 W 088 27.0328	4194.8	Crawler shows no reaction to release signal	No picture
23/09/2015	00:06:26	Southern Reference (Outside DEA)	S 07 07.5315 W 088 27.0321	4196.0125	MICP-2-2 put on sediment	No picture
23/09/2015	00:19:05	Southern Reference (Outside DEA)	S 07 07.5378 W 088 27.0353	4198.1	ROV shakes Crawler to help the release mechanism	No picture
23/09/2015	00:30:42	Southern Reference (Outside DEA)	S 07 07.5150 W 088 27.0143	4195.025	MICP-2-2 picked up on ROV porch	No picture
23/09/2015	01:00:51	Southern Reference (Outside DEA)	S 07 07.5048 W 088 27.0059	4192.1	Upper HD off	No picture
23/09/2015	03:12:45	Southern Reference (Outside DEA)	S 07 07.4859 W 088 27.0374	4136.15862	OFF THE BOTTOM	No picture

created 28/09/2015 00:25:16

Dive summary

Kiel 6000 - Dive: 219-1

SO242/2 (RV Sonne)

Date: **23/09/2015**
Observers: **BOETIUS Antje, BROWN Alastair, HAECKEL Matthias, JANSSEN Felix, MEVENKAMP Lisa, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.684 W 088 27.455**

Dive duration:

Start: **23/09/2015 16:25:12**
At bottom: **23/09/2015 18:05:18**
Leave bottom: **24/09/2015 01:49:30**
End: **24/09/2015 03:22:49**

Explored sites:

Aims of the Dive:

1. Sample track with chamber, profiler, pushcores
2. Deploy inCUBEator chambers for food web studies
3. fill respiration chambers
4. slurp holothurians

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. Senckenberg box

On Elevator:

1. Elevator 1 down: 2 Chamber, 2 Profiler, Amphipod trap
2. Elevator 2 down: 2 CUBEs, 4 respirometers, 2x6 push cores
3. Elevator 1 up (1 day later): 2 Chamber, 2 Profiler, Amphipod trap
4. Elevator 2 up (4 days later): 2 CUBEs, 4 respirometers, 2x6 push cores

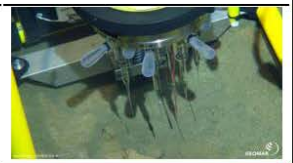
Dive summary:

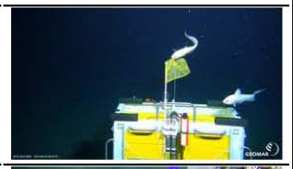
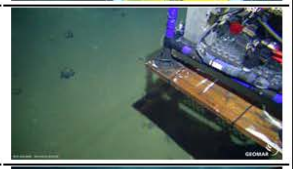
Dive SO242-2_219 (protocol by Tanja Stratmann)
This dive began by the deployment of the two MPI profilers on white ripples, before both profilers were re-positioned two times during the dive. Also the two MPI chambers were deployed, before 14 pushcores were sampled at white patches and on the sediment hill. Two more pushcores were taken in a valley directly next to a white patch. Cube 2 and 3 were placed over one Scotoplanes specimen each and the cube program was started by pushing the start button. The BICS chambers were filled with two Palaeopatides sp., one Benthothuria and one Peniagone sp. Additionally, one Benthodytes specimen was transferred into the Senckenberg biobox after it was damaged while trying to suck it for transport to the BICS chamber and one unknown holothurian species was caught with the handnet and transferred to the Senckenberg biobox.

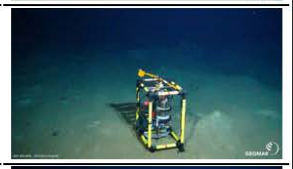
Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
23/09/2015	18:05:18	DEA Central Plough Track	S 07 04.6851 W 088 27.4827	4172.45	AT THE BOTTOM	No picture

23/09/2015	18:24:21	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.73333	photo of small hill with white spots	
23/09/2015	18:24:40	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.9	photo of small hill with white spots	
23/09/2015	18:26:39	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.3	photo of white spot that is smoother	
23/09/2015	18:31:09	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of white area and profiler 1	
23/09/2015	18:34:32	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.5	profiler 1 positioned on less tilted position on white area in the wide track and activated with magnet bar	No picture
23/09/2015	18:36:53	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.43333	close-up photo of microsensors of profiler 1	
23/09/2015	18:37:09	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.28571	photo of microsensors of profiler 1	
23/09/2015	18:52:28	DEA Central Plough Track	S 07 04.6972 W 088 27.4450	4192.2	photo of thin (4m wide) plough track	
23/09/2015	19:02:32	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.65714	photo of ripple field	

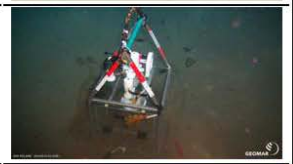
23/09/2015	19:03:36	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.15714	photo of ripple field	
23/09/2015	19:05:59	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.5	profiler 2 positioned on ripple valley in the wide track near profiler 1	No picture
23/09/2015	19:07:09	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.5	Photo of microsensors of profiler 2 taken	
23/09/2015	19:27:42	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4192.31429	photo of white patch in a small depression	
23/09/2015	19:33:40	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4193.8	Lower HD rec. on	No picture
23/09/2015	19:37:49	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4193.8	chamber 1 is positioned on whitish sediments	No picture
23/09/2015	19:43:07	DEA Central Plough Track	S 07 04.7029 W 088 27.4502	4191	Lower HD rec. off	No picture
23/09/2015	19:45:07	DEA Central Plough Track	S 07 04.6911 W 088 27.4529	4191.98571	photo of profiler 2 on whitish spot	
23/09/2015	19:47:11	DEA Central Plough Track	S 07 04.6874 W 088 27.4709	4193	profiler 2 is activated	No picture
23/09/2015	19:53:31	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4192.75714	Lower HD rec. on	No picture
23/09/2015	19:58:59	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4193.8	close-up photo of profiler 2 with green ring partly visible	

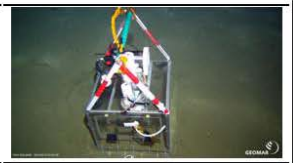
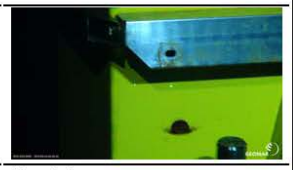
23/09/2015	19:59:19	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4193.8	close-up photo of profiler 2 with green ring partly visible	
23/09/2015	20:03:01	DEA Central Plough Track	S 07 04.7075 W 088 27.4534	4190	Lower HD rec. off	No picture
23/09/2015	20:07:21	DEA Central Plough Track	S 07 04.6874 W 088 27.4709	4190.75	photo of fish on top of elevator 1	
23/09/2015	20:24:20	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.58571	photo of chamber 2 flying over sediment valley	
23/09/2015	20:24:50	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.7	photo of chamber 2 flying over sediment valley	
23/09/2015	20:35:26	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.2	close-up photo of chamber 2	
23/09/2015	20:35:42	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.1	close-up photo of chamber 2	
23/09/2015	20:45:01	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.8	profiler 1 removed from spot prof 1-1	No picture
23/09/2015	20:48:55	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.1	photo of flat ripple	
23/09/2015	20:56:09	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.3	profiler 1 activated on spot prof 1-2	No picture

23/09/2015	20:58:53	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.25714	photo of profiler 1 on spot prof 1-2	
23/09/2015	20:59:05	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.2	photo of profiler 1 on spot prof 1-2	
23/09/2015	20:59:15	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.2	photo of profiler 1 on spot prof 1-2	
23/09/2015	21:01:02	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.78571	photo of spot where PUCs will be taken	
23/09/2015	21:01:24	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.7	photo of spot where PUCs will be taken	
23/09/2015	21:03:24	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.07143	photo of Probeebei	
23/09/2015	21:03:36	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.1	photo of Probeebei without anemone	
23/09/2015	21:04:23	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.4	Lower HD rec. off	No picture
23/09/2015	21:08:20	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #79 taken	No picture
23/09/2015	21:08:22	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #70 taken	No picture
23/09/2015	21:10:55	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #51 taken	No picture

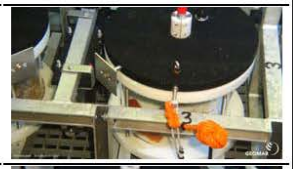
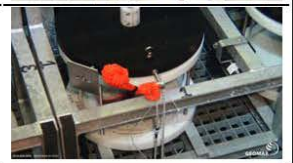
23/09/2015	21:13:44	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #21 taken	No picture
23/09/2015	21:14:45	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	photo of Probeebei with PUCs #70, #51, #75, #21	
23/09/2015	21:16:05	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #58 taken	No picture
23/09/2015	21:17:32	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #10 taken	No picture
23/09/2015	21:18:46	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	PUC #36 taken	No picture
23/09/2015	21:20:29	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #20 taken	No picture
23/09/2015	21:22:29	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #67 taken	No picture
23/09/2015	21:24:27	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #79 taken	No picture
23/09/2015	21:25:31	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #28 taken	No picture
23/09/2015	21:26:09	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	PUC #61 taken	No picture
23/09/2015	21:28:37	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #77 taken	No picture
23/09/2015	21:33:15	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.7	PUC #48 taken	No picture
23/09/2015	21:36:51	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	PUC #30 taken	No picture
23/09/2015	21:41:02	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	PUC #75 taken	No picture
23/09/2015	21:42:49	DEA Central Plough	S 07 04.6930 W 088	4193.7	PUC #68 taken	No picture

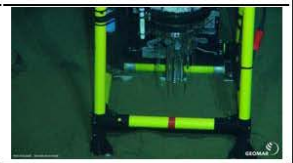
		Track	27.4541			
23/09/2015	21:43:26	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.68571	photo of PUC #75 and #68	
23/09/2015	21:44:05	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of PUCs in valley	
23/09/2015	21:44:25	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of PUCs on white patch	
23/09/2015	21:44:48	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of all PUCs on white spots and in valley	
23/09/2015	22:20:27	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of spot where PUCs have been retrieved	
23/09/2015	22:20:42	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of spot where PUCs have been retrieved (photo out of focus)	
23/09/2015	22:20:53	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4193.6	photo of spot where PUCs have been retrieved (photo out of focus)	
23/09/2015	22:24:36	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.5	photo of profiler 2 at spot prof 2-1	
23/09/2015	22:35:58	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4191.9	photo of spot prof 2-2 for profiler 2	
23/09/2015	22:37:30	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4192	profiler 2 at spot prof 2-2 positioned and started	No picture

23/09/2015	23:01:44	DEA Central Plough Track	S 07 04.6986 W 088 27.4728	4192.3	photo of Scotoplanes sp.	
23/09/2015	23:02:38	DEA Central Plough Track	S 07 04.6986 W 088 27.4728	4192.3	photo of Scotoplanes and crab	
23/09/2015	23:07:28	DEA Central Plough Track	S 07 04.6986 W 088 27.4728	4192.3	photo of open door of Cube 3	
23/09/2015	23:12:40	DEA Central Plough Track	S 07 04.6986 W 088 27.4728	4192.3	photo of Cube 3	
23/09/2015	23:35:36	DEA Central Plough Track	S 07 04.6477 W 088 27.4551	4191.9	photo of Scotoplanes sp.	
23/09/2015	23:39:26	DEA Central Plough Track	S 07 04.6459 W 088 27.4564	4193	photo of Cube 2	
23/09/2015	23:43:09	DEA Central Plough Track	S 07 04.6459 W 088 27.4564	4193.1	photo of Cube 2 with encaged Scotoplanes sp.	
23/09/2015	23:43:44	DEA Central Plough Track	S 07 04.6459 W 088 27.4564	4193.1	photo of Cube 2 with encaged Scotoplanes sp.	
23/09/2015	23:44:08	DEA Central Plough Track	S 07 04.6459 W 088 27.4564	4193.1	photo of Cube 2 with encaged Scotoplanes sp.	

23/09/2015	23:52:59	DEA Central Plough Track	S 07 04.6459 W 088 27.4564	4193.3	photo of Cube 2	
24/09/2015	00:01:51	DEA Central Plough Track	S 07 04.6720 W 088 27.4803	4191.41429	Photo of Paelaeopatides sp.	
24/09/2015	00:02:33	DEA Central Plough Track	S 07 04.6720 W 088 27.4803	4191.71667	Photo of Paelaeopatides sp.	
24/09/2015	00:04:34	DEA Central Plough Track	S 07 04.6720 W 088 27.4803	4192.14286	Palaeopatides sp. sampled with suction pump	No picture
24/09/2015	00:09:40	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.4	Palaeopatides sp. delivered to BICS chamber 4 on elevator 2	No picture
24/09/2015	00:19:42	DEA Central Plough Track	S 07 04.7100 W 088 27.4770	4191.76667	photo of orange Paelaeopatides sp.	
24/09/2015	00:19:56	DEA Central Plough Track	S 07 04.7100 W 088 27.4773	4191.9	photo of orange Paelaeopatides sp.	
24/09/2015	00:20:28	DEA Central Plough Track	S 07 04.7101 W 088 27.4775	4192.28333	Photo of brisingid on stalk	
24/09/2015	00:21:55	DEA Central Plough Track	S 07 04.7102 W 088 27.4789	4191.98333	Orange Palaeopatides sp. sampled with suction pump	No picture
24/09/2015	00:24:54	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4191.7	photo of elevator 2	
24/09/2015	00:25:43	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192	Orange Palaeopatides sp. delivered to BICS	No picture

					chamber 3	
24/09/2015	00:27:57	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4191.6	Photo of Bethodytes sp.	
24/09/2015	00:28:27	DEA Central Plough Track	S 07 04.6834 W 088 27.4808	4191.9	Photo of Bethodytes sp.	
24/09/2015	00:28:51	DEA Central Plough Track	S 07 04.6829 W 088 27.4802	4192.12857	Photo of Bethodytes sp.	
24/09/2015	00:31:13	DEA Central Plough Track	S 07 04.6820 W 088 27.4789	4192.7	Benthodytes sp. sampled with suction pump and delivered to Senckenberg biobox	No picture
24/09/2015	00:35:59	DEA Central Plough Track	S 07 04.6827 W 088 27.4741	4191.6125	Photo of Benthothuria sp.	
24/09/2015	00:38:36	DEA Central Plough Track	S 07 04.6806 W 088 27.4731	4192.4	Benthothuria sp. sampled with suction pump	No picture
24/09/2015	00:41:54	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.2	Benthothuria sp. delivered to BICS chamber 1	No picture
24/09/2015	00:45:17	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.4	photo of unknown holothurian species	
24/09/2015	00:46:49	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.6	Photo of Bethothuria sp.	No picture
24/09/2015	00:50:14	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.8	unknown holothurian species sampled with handnet and delivered to Senckenbeg biobox	No picture

24/09/2015	00:51:38	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.8	Photo of red shrimp	No picture
24/09/2015	00:57:40	DEA Central Plough Track	S 07 04.6585 W 088 27.4820	4192.8	photo of white Synallactes	No picture
24/09/2015	00:58:19	DEA Central Plough Track	S 07 04.6554 W 088 27.4837	4192.9	photo of white Synallactes	
24/09/2015	00:58:52	DEA Central Plough Track	S 07 04.6554 W 088 27.4837	4192.8	Peniagone sampled with suction pump	No picture
24/09/2015	01:01:46	DEA Central Plough Track	S 07 04.6702 W 088 27.4880	4192.1	Peniagone delivered to BICS chamber 2	No picture
24/09/2015	01:10:42	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.7	photo of BICS chamber 3	
24/09/2015	01:10:51	DEA Central Plough Track	S 07 04.6854 W 088 27.4856	4192.7	photo of BICS chamber 1	
24/09/2015	01:16:56	DEA Central Plough Track	S 07 04.6930 W 088 27.4541	4192.7	photo of chamber 2 and profiler 1	
24/09/2015	01:27:45	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.1	photo of profiler 1	
24/09/2015	01:28:13	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.1	photo of profiler 1 and ripple where profiler will be placed (spot prof 1-3)	
24/09/2015	01:33:02	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.4	profiler 1 positioned on spot prof 1-3 and activated	No picture
24/09/2015	01:35:24	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.2125	Lower HD rec. on	No picture

24/09/2015	01:35:28	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.2	Lower HD rec. off	No picture
24/09/2015	01:37:02	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4193.0875	Lower HD rec. on	No picture
24/09/2015	01:38:08	DEA Central Plough Track	S 07 04.6874 W 088 27.4516	4192.6375	photo of profiler 1 on spot prof 1-3	
24/09/2015	01:41:57	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4191.6	Lower HD rec. off	No picture
24/09/2015	01:46:01	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4192.2	profiler 2 positioned at spot prof 2-3	No picture
24/09/2015	01:46:26	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4192.2	photo of profiler 2 on spot prof 2-3	
24/09/2015	01:46:48	DEA Central Plough Track	S 07 04.7197 W 088 27.4808	4192.22857	photo of profiler 2 on spot prof 2-3	
24/09/2015	01:49:30	DEA Central Plough Track	S 07 04.7196 W 088 27.4763	4188.67143	OFF THE BOTTOM	No picture
24/09/2015	01:50:49	DEA Central Plough Track	S 07 04.7192 W 088 27.4781	4176.7	Upper HD off	No picture

created 28/09/2015 00:32:25

Dive summary

Kiel 6000 - Dive: 222-1

SO242/2 (RV Sonne)

Date: **24/09/2015**
Observers: **BOETIUS Antje, HAECKEL Matthias, JANSSEN Felix, LINS Lidia, MUELLER Samuel, PAUL Sophie, PURSER Autun, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.684 W 088 27.455**

Dive duration:

Start: **24/09/2015 14:58:54**
At bottom: **24/09/2015 16:29:46**
Leave bottom: **25/09/2015 01:00:53**
End: **25/09/2015 02:34:51**

Explored sites:

Aims of the Dive:

1. chamber, profiler, pushcores
2. slurp holothurians/animals
3. filming of track landscape

Required Tools:

1. 16 pushcores
2. suction pump
3. magnetic stick
4. nodule scoop
5. Senckenberg box
6. chamber 3 on porch (down)
7. some extra pushcores in six-pack on porch (up)

On Elevator:

1. Elevator 1 up: 2 Chamber, 2 Profiler

Dive summary:

Dive SO242-2_222 (protocol by Felix Janssen)
Dive 222 carried out investigations in the disturbance area in the central DEA where several DEA plough tracks of different width cross. The focus of the dive was on flux measurements with benthic chambers and micro profilers, on push coring, and on sampling of organisms. A benthic chamber of MPI/AWI that was brought down on the porch of the ROV was deployed on a crest in the track. Two more benthic chambers that were deployed during the previous dive (SO242-2_219) on the disturbance track (microenvironments white spot and valley) were collected at the end of the dive. Two micro profilers of MPI/AWI that were also already deployed during dive 219 were each repositioned twice (profiler 1: valley, undisturbed off track on patch with freshly removed nodules; profiler 2: white spot, white spot between ripples) and also collected in the end. A total of 16 push cores were taken in the disturbance track, 3 on white patch and 13 in a valley. A total of 11 fauna samples (ophiuroid, crinoid, isopods, amphipods, sponge, parapagurid crab with anemone, unidentified worm) were obtained using the slurp gun and the ROV's manipulator and transported up in the Senckenberg biobox (8 samples) and the slurp gun containers (3 samples). In the beginning of the dive the ROV had technical problems that required a restart of the system. Posidonia positioning quality was poorer than in previous dives.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
24/09/2015	16:29:46	DEA Central Plough Track	S 07 04.7042 W 088 27.4603	4175.85	AT THE BOTTOM	No picture
24/09/2015	16:52:56	DEA Central Plough Track	S 07 04.7029 W 088 27.4568	4191	Moving to disturbance track for deployment of ROV chamber 3 of MPI/AWI ('chamber 3'), some technical problems with ROV	No picture

24/09/2015	16:54:12	DEA Central Plough Track	S 07 04.7035 W 088 27.4553	4191.1	Chamber 3 taken from ROV porch for deployment in disturbance track	No picture
24/09/2015	17:00:45	DEA Central Plough Track	S 07 04.7035 W 088 27.4553	4193.5	Chamber 3 positioned on hill in ripple field	No picture
24/09/2015	17:00:46	DEA Central Plough Track	S 07 04.7035 W 088 27.4553	4193.5	START OF MEASUREMENT: SO242-2_D222_BFC3 (ROV chamber 3 of MPI/AWI)	No picture
24/09/2015	17:05:18	DEA Central Plough Track	S 07 04.7035 W 088 27.4553	4192.38571	Checking chamber penetration depth, green ring not visible - overlying water height between 10 and 12.5 cm	No picture
24/09/2015	17:05:51	DEA Central Plough Track	S 07 04.7035 W 088 27.4553	4191.8375	Restarting of the ROV system	No picture
24/09/2015	17:20:24	DEA Central Plough Track	S 07 04.6847 W 088 27.4670	4190.6	ROV is staying close to elevator 'OSCA' of GEOMAR ('elevator 1') during restart	
24/09/2015	17:39:36	DEA Central Plough Track	S 07 04.6866 W 088 27.4708	4190.92857	ROV restart successful	No picture
24/09/2015	17:51:29	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4192.6	Arriving at ROV micro profiler 1 of MPI/AWI ('profiler 1'). Profiler was deployed on ripple crest at the previous dive (SO242-2_216)	No picture
24/09/2015	17:51:30	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4192.6	END OF MEASUREMENT: SO242-2_D219_MICP_1-3 (started at previous dive)	No picture
24/09/2015	17:57:38	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.5	Profiler 1 lifted off the sediment for nearby re-deployment	No picture
24/09/2015	18:01:48	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.7	Searching for a good ripple site for deployment of profiler 1	
24/09/2015	18:02:04	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	Searching for a good ripple site for deployment of profiler 1	
24/09/2015	18:02:10	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	Photo of ripples for profiler 1 taken	No picture
24/09/2015	18:03:15	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	Ripples where profiler 1 is going to be deployed	

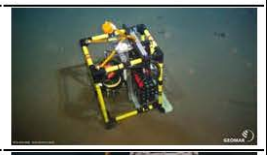
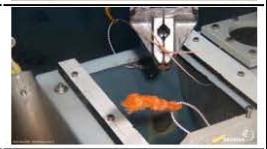
24/09/2015	18:04:09	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.9	Profiler 1 deployed between ripples	No picture
24/09/2015	18:06:05	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	Profiler 1 pushed into the sdiment	No picture
24/09/2015	18:08:29	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	Program of profiler 1 started with magnet	No picture
24/09/2015	18:08:30	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.8	START OF MEASUREMENT: SO242-2_D222_MICP_1-1 (ROV profiler 1 of MPI/AWI, first measurement)	No picture
24/09/2015	18:11:06	DEA Central Plough Track	S 07 04.6839 W 088 27.4603	4192.3	Posidonia position unstable and not reliable	No picture
24/09/2015	18:11:18	DEA Central Plough Track	S 07 04.6847 W 088 27.4614	4192.2875	Flying towards ROV micro profiler 1 of MPI/AWI ('profiler 1') for redeployment	No picture
24/09/2015	18:14:23	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4191.8	Arriving at profiler 2. Profiler was deployed in undisturbed site off track at the previous dive (SO242-2_216)	No picture
24/09/2015	18:14:24	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4191.8	END OF MEASUREMENT: SO242-2_D219_MICP_2-3 (started at previous dive)	No picture
24/09/2015	18:17:59	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4191.5	Profiler 2 lifted off the sediment, flying to the track	No picture
24/09/2015	18:20:24	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4192	Looking for a white spot to redeploy profiler 2	No picture
24/09/2015	18:25:10	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4191.9	Ripples in the vicinity of the spot where profiler 2 is going to be deployed	
24/09/2015	18:26:28	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4192.28571	White spot where profiler 2 is going to be deployed	
24/09/2015	18:28:08	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4192.5	Profiler 2 positioned on white spot	No picture
24/09/2015	18:29:12	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4192.5	Profiler 2 started with magnet	No picture
24/09/2015	18:29:13	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4192.5	START OF MEASUREMENT: SO242-2_D222_MICP_2-1 (ROV profiler 2 of MPI/AWI, first measurement)	No picture

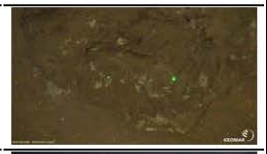
24/09/2015	18:30:11	DEA Central Plough Track	S 07 04.7044 W 088 27.5033	4192.5	Profiler 2 at the deployment site	
24/09/2015	18:35:37	DEA Central Plough Track	S 07 04.7048 W 088 27.4875	4191.5	OBSERVATION: crab	No picture
24/09/2015	18:36:50	DEA Central Plough Track	S 07 04.7059 W 088 27.4828	4191.6	OBSERVATION: Holothurian	No picture
24/09/2015	18:37:03	DEA Central Plough Track	S 07 04.7079 W 088 27.4819	4191.6	OBSERVATION: crab	No picture
24/09/2015	18:37:38	DEA Central Plough Track	S 07 04.7110 W 088 27.4779	4191.7	OBSERVATION: Holothurian	No picture
24/09/2015	18:49:44	DEA Central Plough Track	S 07 04.6806 W 088 27.4522	4192	Posidonia positioning difficult	No picture
24/09/2015	18:50:01	DEA Central Plough Track	S 07 04.6797 W 088 27.4518	4191.9	Arriving at white patches where PCs should be taken	No picture
24/09/2015	18:51:52	DEA Central Plough Track	S 07 04.6824 W 088 27.4465	4193.08333	Animal tracks on the seafloor	
24/09/2015	18:52:02	DEA Central Plough Track	S 07 04.6828 W 088 27.4468	4193.2	OBSERVATION: crab	No picture
24/09/2015	18:52:10	DEA Central Plough Track	S 07 04.6833 W 088 27.4470	4193.25714	White patch mound	
24/09/2015	18:54:56	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4193.4	Taking 3 push cores for meiofauna in white patch	No picture
24/09/2015	18:56:42	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.01667	ROV landing for pushcoring	No picture
24/09/2015	18:56:47	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.1	White patch mound where push core sampling is going to happen	
24/09/2015	19:00:36	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	Push cores #40, #62 and #83 inserted into sediment	

24/09/2015	19:04:10	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	3 push cores for meiofauna in white patch collected	No picture
24/09/2015	19:04:11	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	SAMPLE: SO242-2_D222_PUC40	No picture
24/09/2015	19:04:12	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	SAMPLE: SO242-2_D222_PUC62	No picture
24/09/2015	19:04:13	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	SAMPLE: SO242-2_D222_PUC83	No picture
24/09/2015	19:04:26	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4194.4	Sediment has jelly-like consistency	No picture
24/09/2015	19:07:42	DEA Central Plough Track	S 07 04.6910 W 088 27.4462	4193.2	Leaving white patch spot to search for vally spot for push coring	No picture
24/09/2015	19:10:59	DEA Central Plough Track	S 07 04.6923 W 088 27.4447	4192.2	OBSERVATION: Holothurian	No picture
24/09/2015	19:11:14	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4192.2	Spot for ripple valley pushcoring identified	No picture
24/09/2015	19:16:44	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4193.3	ROV landing for pushcoring	No picture
24/09/2015	19:18:22	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194	Moving ROV a bit backwards and to the right and landing again	No picture
24/09/2015	19:20:01	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.48333	Ripple valley where push coring will take place	
24/09/2015	19:43:25	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	OBSERVATION: Fish	No picture
24/09/2015	19:45:25	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	Push cores #13, #34, #35, #24, #37, #46, #47, #12, #5, #25, #65, #14, #22 inserted in ripple valley	
24/09/2015	19:45:36	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	Push cores in ripple valley	

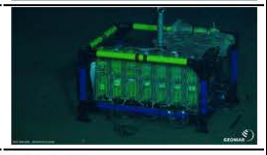
24/09/2015	19:45:55	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	Push cores in ripple valley	
24/09/2015	20:01:29	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	last push cores (#13, #34, #46, #14) in ripple valley	
24/09/2015	20:02:00	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC22 (good)	No picture
24/09/2015	20:02:01	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC25 (good)	No picture
24/09/2015	20:02:02	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC5	No picture
24/09/2015	20:02:03	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC65 (only half full)	No picture
24/09/2015	20:02:04	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC12 (good)	No picture
24/09/2015	20:02:05	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC37 (half full, surface whirled up)	No picture
24/09/2015	20:02:06	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC47 (good)	No picture
24/09/2015	20:02:07	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC24	No picture
24/09/2015	20:02:08	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	SAMPLE: SO242-2_D222_PUC35 (long)	No picture
24/09/2015	20:09:12	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.3	SAMPLE: SO242-2_D222_PUC34	No picture
24/09/2015	20:09:13	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.3	SAMPLE: SO242-2_D222_PUC46 (very long, put into drawer without outer case; case was lost earlier)	No picture
24/09/2015	20:09:14	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.3	SAMPLE: SO242-2_D222_PUC14 (short)	No picture
24/09/2015	20:09:33	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.3	SAMPLE: SO242-2_D222_PUC13 (very long)	No picture

24/09/2015	20:10:50	DEA Central Plough Track	S 07 04.6922 W 088 27.4440	4194.4	Push coring finished	No picture
24/09/2015	20:15:03	DEA Central Plough Track	S 07 04.7197 W 088 27.4380	4192.525	Flying to profiler 1 for repositioning at undisturbed site of track on freshly removed nodules (and to look for plastics)	No picture
24/09/2015	20:20:00	DEA Central Plough Track	S 07 04.6777 W 088 27.4386	4192.6	OBSERVATION: Isopod	
24/09/2015	20:26:40	DEA Central Plough Track	S 07 04.6704 W 088 27.4615	4193.1	Nice footage with track and reference recorded	No picture
24/09/2015	20:31:11	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.58571	Arriving at profiler 1	No picture
24/09/2015	20:31:12	DEA Central Plough Track	S 07 04.6844 W 088 27.4505	4193.58571	END OF MEASUREMENT: SO242-2_D222_MICP_1-1	No picture
24/09/2015	20:36:59	DEA Central Plough Track	S 07 04.6893 W 088 27.4568	4192.6	Profiler 1 on porch - searching for spot to deploy profiler 1 on freshly removed nodules	No picture
24/09/2015	20:38:04	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.2	First trial to land in front of nodules (set of 3) for removal before deployment of profiler 1	No picture
24/09/2015	20:47:09	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4192.61429	Sediment plume created, repositioning ROV	No picture
24/09/2015	20:47:50	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.21429	Nodules (set of 5) before removal	
24/09/2015	20:48:20	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.66667	Nodules (set of 5, close up) before removal	
24/09/2015	21:01:36	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	Field is cleared of 3 nodules. Two recovered, one lost upon sampling	
24/09/2015	21:01:48	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	SAMPLE: SO242-2_D222_COLBOX1A (Biobox Senckenberg, polymetallic nodule), collected with scoop	No picture
24/09/2015	21:01:49	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	SAMPLE: SO242-2_D222_COLBOX1B (Biobox Senckenberg, polymetallic nodule), collected with scoop	No picture

24/09/2015	21:03:34	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	Profiler 1 lowered to the seafloor with sensors above the hole sits above hole	No picture
24/09/2015	21:03:34	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	Profiler 1 positioned on hole created upon nodule removal	
24/09/2015	21:04:00	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	starting profiler 1	No picture
24/09/2015	21:04:01	DEA Central Plough Track	S 07 04.6793 W 088 27.4669	4193.9	START OF MEASUREMENT: SO242-2_D222_MICP_1-2 (ROV profiler 1 of MPI/AWI, second measurement)	No picture
24/09/2015	21:30:03	DEA Central Plough Track	S 07 04.7250 W 088 27.4894	4191.54286	Arriving at Profiler 2 for repositioning between ripples	No picture
24/09/2015	21:30:04	DEA Central Plough Track	S 07 04.7250 W 088 27.4894	4191.54286	END OF MEASUREMENT: SO242-2_D222_MICP_2-1	No picture
24/09/2015	21:36:07	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4192.5	Profiler 2 on whitish spot (between ripples?)	
24/09/2015	21:36:18	DEA Central Plough Track	S 07 04.7084 W 088 27.4790	4192.51429	Profiler 2 on whitish spot (between ripples?)	
24/09/2015	21:37:45	DEA Central Plough Track	S 07 04.6969 W 088 27.4827	4192.5	START OF MEASUREMENT: SO242-2_D222_MICP_2-2 (ROV profiler 2 of MPI/AWI, second measurement)	No picture
24/09/2015	21:38:00	DEA Central Plough Track	S 07 04.6959 W 088 27.4842	4192.5	Profiler 2 at the start of deployment 2-2	
24/09/2015	21:45:11	DEA Central Plough Track	S 07 04.6872 W 088 27.4714	4193.6	Ophiuroid collected	
24/09/2015	21:45:23	DEA Central Plough Track	S 07 04.6875 W 088 27.4712	4193.6	SAMPLE: SO242-2_COLBOX2 (Biobox Senckenberg, ophiuroid), collected with manipulator	No picture
24/09/2015	21:49:34	DEA Central Plough Track	S 07 04.6840 W 088 27.4733	4193.57143	Two amphipods collected with the slurp gun	No picture

24/09/2015	21:49:35	DEA Central Plough Track	S 07 04.6840 W 088 27.4733	4193.57143	SAMPLES: SO242-2_COLBOX3A; SAMPLE: SO242-2_COLBOX3B (Biobox Senckenberg, 2 amphipods), collected with slurpgun	No picture
24/09/2015	21:54:23	DEA Central Plough Track	S 07 04.6807 W 088 27.4595	4192.8	Probeebei with anemone	
24/09/2015	21:54:54	DEA Central Plough Track	S 07 04.6827 W 088 27.4631	4192.8	Probeebei with anemone	
24/09/2015	22:01:50	DEA Central Plough Track	S 07 04.6870 W 088 27.4557	4192.4	SAMPLE: SO242-2_COLBOX4 (Biobox Senckenberg, Probeebei), collected with slurpgun	No picture
24/09/2015	22:04:51	DEA Central Plough Track	S 07 04.6808 W 088 27.4637	4192.91667	Unknown worm	
24/09/2015	22:05:07	DEA Central Plough Track	S 07 04.6800 W 088 27.4636	4193	Unknown worm	
24/09/2015	22:07:11	DEA Central Plough Track	S 07 04.6752 W 088 27.4625	4193	SAMPLE: SO242-2_COLBOX5 (Biobox Senckenberg, Unknown worm), collected with slurpgun	No picture
24/09/2015	22:11:46	DEA Central Plough Track	S 07 04.6905 W 088 27.4610	4193.2	Isopod and coral	
24/09/2015	22:13:54	DEA Central Plough Track	S 07 04.6817 W 088 27.4649	4193.1	SAMPLE: SO242-2_SLURP1 (slurpgun container #1, isopod)	No picture
24/09/2015	22:22:07	DEA Central Plough Track	S 07 04.6755 W 088 27.4673	4193.1	Burrows	
24/09/2015	22:23:13	DEA Central Plough Track	S 07 04.6754 W 088 27.4668	4193	Ctenophore	

24/09/2015	22:26:00	DEA Central Plough Track	S 07 04.6527 W 088 27.4591	4193.2	Ophiuroid	
24/09/2015	22:34:55	DEA Central Plough Track	S 07 04.6507 W 088 27.4555	4193.6	SAMPLE: SO242-2_COLBOX6 (Biobox Senckenberg, ophiuroid) collected with ROV manipulator	No picture
24/09/2015	22:37:31	DEA Central Plough Track	S 07 04.6616 W 088 27.4578	4194	3 isopods and a sponge	
24/09/2015	22:40:50	DEA Central Plough Track	S 07 04.6720 W 088 27.4448	4194.1	SAMPLE: SO242-2_SLURP2 (slurpgun container #2, isopod)	No picture
24/09/2015	22:43:25	DEA Central Plough Track	S 07 04.6665 W 088 27.4544	4194.1	SAMPLE: SO242-2_SLURP3 (slurpgun container #3, isopod)	No picture
24/09/2015	22:44:44	DEA Central Plough Track	S 07 04.6692 W 088 27.4618	4193.9	SAMPLE: SO242-2_COLBOX7 (Biobox Senckenberg, sponge that had isopode inside), collected with slurpgun	No picture
24/09/2015	22:49:35	DEA Central Plough Track	S 07 04.6513 W 088 27.4607	4194	Crinoid on nodule	
24/09/2015	22:50:04	DEA Central Plough Track	S 07 04.6495 W 088 27.4603	4194.1	Crinoid on nodule (closeup)	
24/09/2015	22:53:46	DEA Central Plough Track	S 07 04.6416 W 088 27.4602	4194.1	Crinoid on nodule in scoop	
24/09/2015	22:54:56	DEA Central Plough Track	S 07 04.6547 W 088 27.4662	4194.1	SAMPLE: SO242-2_COLBOX8 (Biobox Senckenberg, Crinoid on polymetallic nodule), collected with scoop	No picture
24/09/2015	23:06:40	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4193.17143	Glass jar (carrot salad)	

24/09/2015	23:07:01	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4193.3	Glass jar (carrot salad)	
24/09/2015	23:18:10	DEA Central Plough Track	S 07 04.7103 W 088 27.4534	4192.31429	Arriving at ROV chamber 1 of MPI/AWI ('chamber 1') that was deployed on whitish sediments in the disturbance track during the last dive (SO242-2_219). Bromide injection and sampling worked well	No picture
24/09/2015	23:19:01	DEA Central Plough Track	S 07 04.7103 W 088 27.4534	4192.5	Chamber 1 picked up, LED still flashes, measurement program was running throughout deployment	No picture
24/09/2015	23:19:25	DEA Central Plough Track	S 07 04.7103 W 088 27.4534	4192.3	END OF MEASUREMENT: SO242-2_D219_BFC1 (ROV chamber 1 of MPI/AWI)	No picture
24/09/2015	23:27:34	DEA Central Plough Track	S 07 04.7166 W 088 27.4619	4192.3	Chamber 1 stowed on elevator 1	No picture
24/09/2015	23:31:50	DEA Central Plough Track	S 07 04.7013 W 088 27.4600	4192.4	Arriving at ROV chamber 2 of MPI/AWI ('chamber 2') that was deployed on a valley on the disturbance track during the last dive (SO242-2_219)	
24/09/2015	23:32:08	DEA Central Plough Track	S 07 04.7013 W 088 27.4600	4192.6	Checking syringe sampler: Bromide injection worked well, syringe sample 2 only partly taken	
24/09/2015	23:33:22	DEA Central Plough Track	S 07 04.7050 W 088 27.4547	4192.6	Lower HD on to check penetration depth and position of chamber 2	No picture
24/09/2015	23:34:04	DEA Central Plough Track	S 07 04.7135 W 088 27.4520	4192.55556	Lower HD off	No picture
24/09/2015	23:36:47	DEA Central Plough Track	S 07 04.7194 W 088 27.4577	4191.48333	Chamb_1-1_D219 picked up	No picture
24/09/2015	23:36:48	DEA Central Plough Track	S 07 04.7194 W 088 27.4577	4191.48333	END OF MEASUREMENT: SO242-2_D219_BFC2 (ROV chamber 2 of MPI/AWI)	No picture
24/09/2015	23:42:24	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.3	Chamber 2 stowed on elevator 1	No picture
24/09/2015	23:47:24	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.6	Chamber 1 and chamber 2 fixed on elevator 1	No picture

24/09/2015	23:54:16	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4191.4	Arriving at profiler 1 to collect instrument	
24/09/2015	23:54:22	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4191.4	Profiler 1 and ROV imprint	
24/09/2015	23:55:34	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4191.98571	Profiler 1 ligth is on: profile finished	No picture
24/09/2015	23:56:31	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.4	Closeup of spot below sensors of profiler 1	
24/09/2015	23:56:40	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.5	Closeup of spot below sensors of profiler 1	
24/09/2015	23:56:51	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.5	Closeup of spot below sensors of profiler 1	
24/09/2015	23:59:13	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.12857	Profiler 1 picked up	No picture
24/09/2015	23:59:14	DEA Central Plough Track	S 07 04.6823 W 088 27.4644	4192.12857	END OF MEASUREMENT: SO242-2_D222_MICP_1-2	No picture
25/09/2015	00:15:44	DEA Central Plough Track	S 07 04.7078 W 088 27.4586	4192.5	Profiler 1 carried to elevator 1	No picture
25/09/2015	00:17:25	DEA Central Plough Track	S 07 04.6900 W 088 27.4563	4192.5	Profiler 1 fixed on elevator 1 after adjustment of position	No picture
25/09/2015	00:43:29	DEA Central Plough Track	S 07 04.6937 W 088 27.4629	4191.6	Profiler 2 picked up	No picture
25/09/2015	00:43:30	DEA Central Plough Track	S 07 04.6937 W 088 27.4629	4191.6	END OF MEASUREMENT: SO242-2_D222_MICP_2-2	No picture
25/09/2015	00:53:28	DEA Central Plough Track	S 07 04.7035 W 088 27.4602	4192.5	Profiler 2 carried to elevator 1	No picture
25/09/2015	00:53:50	DEA Central Plough Track	S 07 04.7049 W 088 27.4588	4192.5	Profiler 2 fixed to elevator 1	No picture

25/09/2015	00:58:34	DEA Central Plough Track	S 07 04.7033 W 088 27.4676	4192.08333	Release of elevator 1 top buoy	No picture
25/09/2015	01:00:53	DEA Central Plough Track	S 07 04.6978 W 088 27.4672	4190.8	OFF THE BOTTOM	No picture

created 28/09/2015 00:36:32

Dive summary

Kiel 6000 - Dive: 232-1

SO242/2 (RV Sonne)

Date: **27/09/2015**
Observers: **BOETIUS Antje, HAECKEL Matthias, JANSSEN Felix, STRATMANN Tanja, SWEETMAN Andrew, VAN OEVELEN Dick, VONNAHME Tobias, WENZHOEFER Frank**
Position: **S 07 04.679 W 088 27.465**

Dive duration:

Start: **27/09/2015 13:46:43**
At bottom: **27/09/2015 15:33:47**
Leave bottom: **27/09/2015 21:56:49**
End: **27/09/2015 23:32:58**

Explored sites:

Aims of the Dive:

1. CUBE experiments
2. profiler
3. pushcoring

Required Tools:

1. 16 pushcores
2. suction pump
3. 2 larvae pots
4. nodule collectors
5. Senckenberg biobox
6. blade core box in front of ROV

On Elevator:

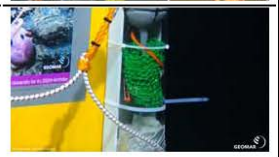
1. Elevator 2 up: 2 CUBEs + 1 profiler, 2 sixpacks with push cores
2. Elevator 1 up: 2x2 blade cores, 4 chambers

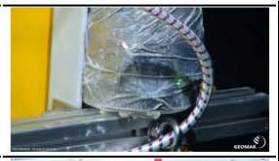
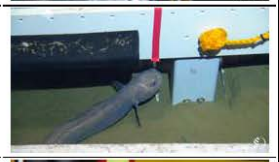
Dive summary:

Dive SO242-2_232 (protocol by Dick Van Oevelen)
Dive 232 was the last scientific dive of this cruise and was used to collect remaining instruments from the seafloor and to take the last set of pushcores. First, the MPI chamber 1+4 were deployed and recovered later in the dive (Chamber 1 on nodule, Chamber 4 on ripple). The Profiler already started due to time out with profiling on the elevator so all sensors were broken and therefore the profiler wasn't deployed. Then CUBE2 and CUBE3 were recovered by slurping holothurians and sampling with pushcores and bladecorers. A set of pushcores was taken on the ripple crest and in ripple valleys.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
27/09/2015	15:33:47	DEA Central Plough Track	S 07 04.6797 W 088 27.4878	4168.56	AT THE BOTTOM	No picture
27/09/2015	15:52:15	DEA Central Plough Track	S 07 04.6819 W 088 27.4868	4188.1	dive start, Frank and Antje in ROV container	No picture
27/09/2015	15:54:13	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4190.85556	start with chamber 1, will be placed on ref with nodule	No picture

27/09/2015	15:55:12	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4191.85556	lots of fish around the elevator because of amphipod traps	No picture
27/09/2015	15:55:30	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192	Photo: Fish trying to get in amphipod trap	
27/09/2015	15:55:40	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.07778	Photo: Fish around elevator because of amphipod trap	
27/09/2015	15:57:18	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.41429	Photo: Fish around elevator because of amphipod trap	
27/09/2015	15:57:50	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.5	Photo: Fish around elevator because of amphipod trap	
27/09/2015	16:00:33	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192	Photo: Munidopsis on nodule	
27/09/2015	16:06:48	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4193.2	Photo: Chamber 1 (placed on D232) close up, penetration depth 10 cm	
27/09/2015	16:10:53	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4190.67143	Photo: Many white fish around elevator1	
27/09/2015	16:12:48	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.1	Photo: Close-up of amphipod	
27/09/2015	16:13:07	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.22857	Photo: Close-up of amphipod	

27/09/2015	16:13:36	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.5	Photo: Close-up of amphipod	
27/09/2015	16:14:23	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.6	Photo: Close-ups of fish around elevator	
27/09/2015	16:14:55	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192.5	Photo: Close-ups of fish around elevator	
27/09/2015	16:17:15	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192	Photo: Close-ups of fish around elevator	
27/09/2015	16:17:18	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4192	Chamber 4 from elevator, go to track to find ripple	No picture
27/09/2015	16:22:31	DEA Central Plough Track	S 07 04.6946 W 088 27.4665	4193.02857	Photo: Ripple in track to place Chamber 4	
27/09/2015	16:22:54	DEA Central Plough Track	S 07 04.6946 W 088 27.4665	4193.2	Photo: Ripple in track to place Chamber 4	
27/09/2015	16:23:17	DEA Central Plough Track	S 07 04.6946 W 088 27.4665	4193.34286	Ripple hard to see from above, but well visible on HD camera	No picture
27/09/2015	16:27:04	DEA Central Plough Track	S 07 04.6946 W 088 27.4665	4193.5	Chamber 4-1 D232 placed	No picture
27/09/2015	16:27:52	DEA Central Plough Track	S 07 04.6946 W 088 27.4665	4193.2	Photo: Chamber 4-1 D232	
27/09/2015	16:34:48	DEA Central Plough Track	S 07 04.6865 W 088 27.4725	4192.7	Profiler on elevator not flashing, check it	No picture
27/09/2015	16:35:59	DEA Central Plough Track	S 07 04.6880 W 088 27.4697	4191.825	Profiler started due to 'time out' and profiled while standing on the elevator	No picture

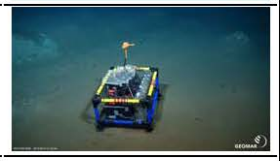
27/09/2015	16:39:22	DEA Central Plough Track	S 07 04.6918 W 088 27.4791	4190.08571	Most electrodes mostly broken, do not use, go to elevator2 to secure it	No picture
27/09/2015	16:49:29	DEA Central Plough Track	S 07 04.7031 W 088 27.4551	4192	Photo: Chamber 3_D219	
27/09/2015	16:50:15	DEA Central Plough Track	S 07 04.7021 W 088 27.4513	4191.9	Chamber 3 D219 - white spot on ripple crest, about to recover and secure on elevator1	No picture
27/09/2015	17:04:16	DEA Central Plough Track	S 07 04.6813 W 088 27.4748	4193	Science changes: Antje & Frank are replaced by Tanja & Dick	No picture
27/09/2015	17:21:24	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.4	Lower HD rec. on	No picture
27/09/2015	17:21:41	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.4	Photo: CUBE2 with holothurian in corner	
27/09/2015	17:21:59	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.5	Lower HD rec. on	No picture
27/09/2015	17:32:29	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Holothurian in larvae pot 2	No picture
27/09/2015	17:35:10	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Photo: Sediment imprint of CUBE2	
27/09/2015	17:35:30	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Photo: Sediment imprint of CUBE2, close up of disturbed section	
27/09/2015	17:35:39	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Photo: Sediment imprint of CUBE2, close up of lower section	No picture
27/09/2015	17:38:52	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	PUC #32	No picture
27/09/2015	17:39:56	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	PUC #40	No picture

27/09/2015	17:40:48	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	PUC #62	No picture
27/09/2015	17:41:03	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Photo: PUCs placement in imprint	
27/09/2015	17:43:49	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Bladecore #3 in sediment	No picture
27/09/2015	17:43:58	DEA Central Plough Track	S 07 04.6470 W 088 27.4569	4194.6	Photo: Bladecorer + PUCs placement in imprint	
27/09/2015	17:53:49	DEA Central Plough Track	S 07 04.6573 W 088 27.4552	4192.2	Lower HD rec. off	No picture
27/09/2015	18:16:32	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4192.6	Photo: CUBE3 with zoom on holothurian	
27/09/2015	18:17:08	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4192.7	Photo: CUBE3 with zoom on holothurian	
27/09/2015	18:19:17	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4193.8	Photo: CUBE3 with zoom on holothurian	
27/09/2015	18:19:37	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	Lower HD rec. on	No picture
27/09/2015	18:19:52	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	Photo: CUBE3 with zoom on holothurian	
27/09/2015	18:51:09	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	Photo: CUBE3 had to move first to keep holothurian in and allow sediment sampling	
27/09/2015	18:55:25	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	PUC #68	No picture

27/09/2015	18:56:48	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	PUC #75	No picture
27/09/2015	18:59:25	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	Bladecore 4 taken with ophiuroid that was in the cube during the 4 days of incubation	No picture
27/09/2015	19:00:57	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	PUC #83	No picture
27/09/2015	19:01:06	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194	Photo: Bladecore + PUCs in imprint	
27/09/2015	19:20:52	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4194.2	Holothurian in right larvae box	No picture
27/09/2015	19:22:41	DEA Central Plough Track	S 07 04.6994 W 088 27.4730	4193.81667	Lower HD rec. off	No picture
27/09/2015	19:37:01	DEA Central Plough Track	S 07 04.6881 W 088 27.4858	4193.6	Photo: Accidental photo	
27/09/2015	19:39:38	DEA Central Plough Track	S 07 04.6827 W 088 27.4782	4192.14286	Dick and Tanja replaced by Matthias and Felix	No picture
27/09/2015	20:01:07	DEA Central Plough Track	S 07 04.6953 W 088 27.4573	4192.4	Lower HD rec. off	No picture
27/09/2015	20:02:55	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4193.16667	Flying eastwards to disturbance track crossing	No picture
27/09/2015	20:03:53	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.02857	Selecting whitish crests on the crossing in the direction of the narrower, N-S track	No picture
27/09/2015	20:04:09	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.26667	Lower HD rec. on	No picture
27/09/2015	20:04:27	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.5	Lower HD rec. off	No picture
27/09/2015	20:04:54	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.6	Ripple relief recorded in lower HD	No picture

27/09/2015	20:06:14	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	PUC sampling of 16 cores on the ripple crest	No picture
27/09/2015	20:07:54	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Photo: Ripple crest site	
27/09/2015	20:08:00	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Setting waypoint PUCs_rip_crest_D232	No picture
27/09/2015	20:08:02	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Lower HD rec. on	No picture
27/09/2015	20:08:22	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	ripple field for PUC sampling recorded with lower HD	No picture
27/09/2015	20:14:28	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Sampling PUCs #71, #50, #36, #??, #66, #72 (sixpack)	No picture
27/09/2015	20:26:49	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Sampling PUCs from drawer: #51, #70, #59, #52, #14, #64, #23, #77 (shifted to the side upon sampling)	No picture
27/09/2015	20:27:19	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Crests are full. we are sampling two PUCs in the valley already now (next action in plan)	No picture
27/09/2015	20:29:27	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	PUC sampling valley core #49, #65 (both from drawer)	No picture
27/09/2015	20:29:33	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Photo: All PUCs on crest and valley	
27/09/2015	20:29:52	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Lower HD rec. off	No picture
27/09/2015	20:45:24	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.55714	Photo: PUC sampling site after collection of cores	
27/09/2015	20:54:57	DEA Central Plough Track	S 07 04.6881 W 088 27.4858	4192.1	After exchanging 6-pack, flying towards the same spot where previous sampling took place	No picture

27/09/2015	21:01:23	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Photo: Sampling site before push coring	
27/09/2015	21:03:10	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Photo: Two cores on the crest (= right crest from the previous sampling): #17 (right crest), #74 (left crest)	
27/09/2015	21:03:24	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.7	Photo: Two cores on the crest (= right crest from the previous sampling): #17 (right crest), #74 (left crest)	
27/09/2015	21:07:13	DEA Central Plough Track	S 07 04.6878 W 088 27.4553	4194.1	Lower HD rec. on	No picture
27/09/2015	21:07:51	DEA Central Plough Track	S 07 04.6841 W 088 27.4515	4194.2	Selecting a white spot some tens of meters further north very close to a spot that has been sampled during a previous dive	No picture
27/09/2015	21:09:02	DEA Central Plough Track	S 07 04.6826 W 088 27.4524	4194.46667	The white patch is elevated / on top of a relatively large mound	No picture
27/09/2015	21:09:29	DEA Central Plough Track	S 07 04.6802 W 088 27.4513	4194.56667	Photo: White patch sampling site before push coring	
27/09/2015	21:12:54	DEA Central Plough Track	S 07 04.6802 W 088 27.4513	4194.7	Photo: Push cores #56 and #82 on white patch	
27/09/2015	21:17:54	DEA Central Plough Track	S 07 04.6837 W 088 27.4605	4191.8	Lower HD rec. off	No picture
27/09/2015	21:29:41	DEA Central Plough Track	S 07 04.6769 W 088 27.4786	4194.2	Antje und Frank in	No picture
27/09/2015	21:29:49	DEA Central Plough Track	S 07 04.6769 W 088 27.4786	4194.2	Lift up Chamber 1 (placed on nodule)	No picture
27/09/2015	21:32:19	DEA Central Plough Track	S 07 04.6769 W 088 27.4786	4194.2	nodule scooped up, goes to bio box	No picture

27/09/2015	21:32:22	DEA Central Plough Track	S 07 04.6769 W 088 27.4786	4194.2	Photo: Nodule in scoop, chamber 1-1 D232	
27/09/2015	21:41:16	DEA Central Plough Track	S 07 04.6911 W 088 27.4677	4191.9	Photo: Chamber 4-1 D232, at edge of track on ripple	
27/09/2015	21:42:16	DEA Central Plough Track	S 07 04.6911 W 088 27.4677	4192.625	Photo: Chamber 4-1 D232, at edge of track on ripple	
27/09/2015	21:42:54	DEA Central Plough Track	S 07 04.6911 W 088 27.4677	4192.6	Photo: Chamber 4-1 D232, at edge of track on ripple	
27/09/2015	21:44:04	DEA Central Plough Track	S 07 04.6911 W 088 27.4677	4191.8	Chamber 4 taken up and placed on elevator 1	No picture
27/09/2015	21:55:02	DEA Central Plough Track	S 07 04.6829 W 088 27.4704	4192.9	end of dive 232	No picture
27/09/2015	21:56:49	DEA Central Plough Track	S 07 04.6822 W 088 27.4717	4179	OFF THE BOTTOM	No picture

created 29/09/2015 03:37:22

Dive summary

Kiel 6000 - Dive: 235-1

SO242/2 (RV Sonne)

Date: **28/09/2015**
Observers: **BOETIUS Antje, LINKE Peter**
Position: **S 07 00.131 W 088 26.551**

Dive duration:

Start: **28/09/2015 21:14:21**
At bottom: **28/09/2015 22:54:30**
Leave bottom: **29/09/2015 03:35:29**
End: **29/09/2015 04:59:33**

Explored sites:

Aims of the Dive:

1. searching for DOS-Lander SO242-2_221-1

Required Tools:

1. None

On Elevator:

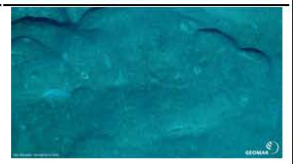
1. None

Dive summary:

This dive is solely for finding and recovering of the not releasing DOS-Mooring.

Dive report:

Date	Hour	Location	Latitude Longitude	Depth (m)	Comments	Picture
28/09/2015	22:54:30	Mountain North of DEA	S 07 00.0844 W 088 26.5162	3856.95	AT THE BOTTOM	No picture
28/09/2015	22:55:33	Mountain North of DEA	S 07 00.0856 W 088 26.5164	3874.64706	upper HD on	No picture
28/09/2015	22:59:15	Mountain North of DEA	S 07 00.0998 W 088 26.5149	3874.17222	Heading towards Lander drop position	No picture
28/09/2015	23:05:14	Mountain North of DEA	S 07 00.1151 W 088 26.4627	3872.69333	Flying to DOS-Position	No picture
28/09/2015	23:08:28	Mountain North of DEA	S 07 00.1029 W 088 26.4749	3872.45714	Flying along crest towards dropping position	No picture

28/09/2015	23:13:48	Mountain North of DEA	S 07 00.1277 W 088 26.5347	3873.8	Photo taken	
28/09/2015	23:14:12	Mountain North of DEA	S 07 00.1288 W 088 26.5364	3872.38571	Photo taken	
28/09/2015	23:14:29	Mountain North of DEA	S 07 00.1295 W 088 26.5375	3871.13571	Lower HD rec. on	No picture
28/09/2015	23:14:38	Mountain North of DEA	S 07 00.1298 W 088 26.5381	3870.47143	Photo taken	
28/09/2015	23:17:51	Mountain North of DEA	S 07 00.1369 W 088 26.5488	3864.26	Photo taken	
28/09/2015	23:21:15	Mountain North of DEA	S 07 00.1373 W 088 26.5527	3864.75333	Lower HD rec. off	No picture
29/09/2015	01:54:32	Mountain North of DEA	S 07 00.0661 W 088 26.6251	3898.7	Photo taken	
29/09/2015	01:58:55	Mountain North of DEA	S 07 00.0635 W 088 26.6299	3892.38	Photo taken	
29/09/2015	03:30:43	Mountain North of DEA	S 07 00.1294 W 088 26.5404	3872.02857	Photo taken	
29/09/2015	03:32:09	Mountain North of DEA	S 07 00.1313 W 088 26.5407	3871	Photo taken	

29/09/2015	03:33:01	Mountain North of DEA	S 07 00.1330 W 088 26.5401	3871	Photo taken	
29/09/2015	03:33:18	Mountain North of DEA	S 07 00.1334 W 088 26.5400	3871	Photo taken	
29/09/2015	03:33:38	Mountain North of DEA	S 07 00.1343 W 088 26.5396	3871	Photo taken	
29/09/2015	03:34:27	Mountain North of DEA	S 07 00.1353 W 088 26.5406	3870.4	Photo taken	
29/09/2015	03:35:29	Mountain North of DEA	S 07 00.1354 W 088 26.5410	3856.48235	OFF THE BOTTOM	No picture
29/09/2015	03:49:23	Mountain North of DEA	S 07 00.1275 W 088 26.5052	3261.58571	upper hd off	No picture

created 29/09/2015 22:54:12

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1	FS POSEIDON Fahrtbericht / Cruise Report POS421, 08. – 18.11.2011, Kiel - Las Palmas, Ed.: T.J. Müller, 26 pp, DOI: 10.3289/GEOMAR_REP_NS_1_2012
2	Nitrous Oxide Time Series Measurements off Peru – A Collaboration between SFB 754 and IMARPE –, Annual Report 2011, Eds.: Baustian, T., M. Graco, H.W. Bange, G. Flores, J. Ledesma, M. Sarmiento, V. Leon, C. Robles, O. Moron, 20 pp, DOI: 10.3289/GEOMAR_REP_NS_2_2012
3	FS POSEIDON Fahrtbericht / Cruise Report POS427 – Fluid emissions from mud volcanoes, cold seeps and fluid circulation at the Don-_Kuban deep sea fan (Kerch peninsula, Crimea, Black Sea) – 23.02. – 19.03.2012, Burgas, Bulgaria - Heraklion, Greece, Ed.: J. Bialas, 32 pp, DOI: 10.3289/GEOMAR_REP_NS_3_2012
4	RV CELTIC EXPLORER EUROFLEETS Cruise Report, CE12010 – ECO2@NorthSea, 20.07. – 06.08.2012, Bremerhaven – Hamburg, Eds.: P. Linke et al., 65 pp, DOI: 10.3289/GEOMAR_REP_NS_4_2012
5	RV PELAGIA Fahrtbericht / Cruise Report 64PE350/64PE351 – JEDDAH-TRANSECT -, 08.03. – 05.04.2012, Jeddah – Jeddah, 06.04 - 22.04.2012, Jeddah – Duba, Eds.: M. Schmidt, R. Al-Farawati, A. Al-Aidaroos, B. Kürten and the shipboard scientific party, 154 pp, DOI: 10.3289/GEOMAR_REP_NS_5_2013
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8	The SUGAR Toolbox - A library of numerical algorithms and data for modelling of gas hydrate systems and marine environments, Eds.: Elke Kossel, Nikolaus Bigalke, Elena Piñero, Matthias Haeckel, 168 pp, DOI: 10.3289/GEOMAR_REP_NS_8_2013
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10	Literaturrecherche, Aus- und Bewertung der Datenbasis zur Meerforelle (*Salmo trutta trutta L.*) Grundlage für ein Projekt zur Optimierung des Meerforellenmanagements in Schleswig-Holstein. Eds.: Christoph Petereit, Thorsten Reusch, Jan Dierking, Albrecht Hahn, 158 pp, DOI: 10.3289/GEOMAR_REP_NS_10_2013
11	RV SONNE Fahrtbericht / Cruise Report SO227 TAIFLUX, 02.04. – 02.05.2013, Kaohsiung – Kaohsiung (Taiwan), Christian Berndt, 105 pp, DOI: 10.3289/GEOMAR_REP_NS_11_2013

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12	RV SONNE Fahrtbericht / Cruise Report SO218 SHIVA (Stratospheric Ozone: Halogens in a Varying Atmosphere), 15.-29.11.2011, Singapore - Manila, Philippines, Part 1: SO218- SHIVA Summary Report (in German), Part 2: SO218- SHIVA English reports of participating groups, Eds.: Birgit Quack & Kirstin Krüger, 119 pp, DOI: 10.3289/GEOMAR_REP_NS_12_2013
13	KIEL276 Time Series Data from Moored Current Meters. Madeira Abyssal Plain, 33°N, 22°W, 5285 m water depth, March 1980 – April 2011. Background Information and Data Compilation. Eds.: Thomas J. Müller and Joanna J. Waniek, 239 pp, DOI: 10.3289/GEOMAR_REP_NS_13_2013
14	RV POSEIDON Fahrtbericht / Cruise Report POS457: ICELAND HAZARDS Volcanic Risks from Iceland and Climate Change:The Late Quaternary to Anthropogene Development Reykjavík / Iceland – Galway / Ireland, 7.-22. August 2013. Eds.: Reinhard Werner, Dirk Nürnberg and the shipboard scientific party, 88 pp, DOI: 10.3289/GEOMAR_REP_NS_14_2014
15	RV MARIA S. MERIAN Fahrtbericht / Cruise Report MSM-34 / 1 & 2, SUGAR Site, Varna – Varna, 06.12.13 – 16.01.14. Eds: Jörg Bialas, Ingo Klaucke, Matthias Haeckel, 111 pp, DOI: 10.3289/GEOMAR_REP_NS_15_2014
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17	RV SONNE, Fahrtbericht / Cruise Report, SO 234/1, "SPACES": Science or the Assessment of Complex Earth System Processes, 22.06. – 06.07.2014, Walvis Bay / Namibia - Durban / South Africa, Eds.: Reinhard Werner and Hans-Joachim Wagner and the shipbord scientific party, 44 pp, DOI: 10.3289/GEOMAR_REP_NS_17_2014
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24	RV POSEIDON Fahrtbericht / Cruise Report POS430, POS440, POS460 & POS467 Seismic Hazards to the Southwest of Portugal; POS430 - La-Seyne-sur-Mer - Portimao (7.4. - 14.4.2012), POS440 - Lisbon - Faro (12.10. - 19.10.2012), POS460 - Funchal - Portimao (5.10. - 14.10.2013), POS467 - Funchal - Portimao (21.3. - 27.3.2014), Ed.: Ingo Grevemeyer, 43 pp, DOI: 10.3289/GEOMAR_REP_NS_24_2015
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26	RV SONNE Fahrtbericht / Cruise Report SO242-1, JPI OCEANS Ecological Aspects of Deep-Sea Mining, DISCOL Revisited, Guayaquil - Guayaquil (Equador), 29.07.-25.08.2015, Ed.: Jens Greinert, 290 pp, DOI: 10.3289/GEOMAR_REP_NS_26_2015

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